

HEALTH AND SAFETY PLAN

PROJECT NAME:	Lower Passaic River Restoration Project – Oversight for Biological Sampling, Community Surveys, and Toxicity and Bioaccumulation Testing		
SITE ADDRESS:	Lower Passaic River, New Jersey		
PIRNIE PROJECT & TASK NUMBER:	USACE Contract No. W912DQ-08-D-0017, Task Order 0010 (Malcolm Pirnie, Inc. Project No. 4553068)		
CLIENT ORGANIZATION:	USACE (and USEPA as customer of the USACE)		
CLIENT ON-SITE CONTACT NAME:	none		
CLIENT SITE CONTACT PHONE No.:	none		
CLIENT OFF-SITE CONTACT NAME:	Beth Buckrucker (USACE) and Stephanie Vaughn (USEPA)		
CLIENT OFF-SITE CONTACT PHONE No.:	816-389-3581 (USACE) and 212-637-3914 (USEPA)		
AMENDMENT TO EXISTING APPROVED HASP <u>yes</u> “Lower Passaic River Restoration Project – Health and Safety Plan” (Malcolm Pirnie, Inc., January 2005) and “CPG Oversight and Split Sample Collection - 2008 Low Resolution Sediment Coring” (Malcolm Pirnie, Inc., July 2008)		EXISTING AMENDMENT NUMBER 03	
SITE TYPE: <i>Check as many as applicable. Add more if needed.</i>			
<input checked="" type="checkbox"/> Active <input type="checkbox"/> Inactive <input type="checkbox"/> Secure <input checked="" type="checkbox"/> Unsecured <input type="checkbox"/> Enclosed Space <input type="checkbox"/> Landfill <input type="checkbox"/> Uncontrolled <input type="checkbox"/> Industrial <input type="checkbox"/> Recovery <input type="checkbox"/> Well Field <input type="checkbox"/> Unknown <input type="checkbox"/> Military		<input checked="" type="checkbox"/> Other (Specify) <u>CERCLA and WRDA site</u> <input checked="" type="checkbox"/> Other (Specify) <u>Lower Passaic River Oversight program for biological sampling, community survey, and toxicity and bioaccumulation testing</u>	
Site Type: The Lower Passaic River is a large tidal estuary. Access and activities will generally be from boats. Some oversight will also take place in field sample processing facilities and off-site commercial laboratories.			

HEALTH AND SAFETY PLAN

EMERGENCY CONTACTS	PHONE	EMERGENCY CONTACTS	NAME	PHONE
Pirnie H&S Emergency #:	800-478-6870	Health and Safety Director:	Chuck Myers	914-484-7151
Poison Control	800-336-6997	Project Manager:	Len Warner (WHI)	914-641-2972
United States Coast Guard	718-354-4119	Site Safety Coordinator:	Len Warner (WHI)	914-641-2972
Fire Department:	Refer to Attachment 1	Client contact:	Beth Buckrucker (USACE)	816-389-3581
			Stephanie Vaughn (USEPA)	212-637-3914
Hospital Name:	St. Michael's Medical Center	Other (Specify):	AmyMarie Accardi-Dey (WHI)	914-641-2699
Hospital Address:	268 Dr. Martin Luther King Jr. Blvd, Newark, NJ 07102	Occupational Physician:	Oversight Field Leader	
Phone:	973-268-8000		Dr Jerry Berke	800-3504511
	973-690-3518	State Spill Number:	NJ State Spill	877-927-6337
Other (Specify)	Claara Maass Medical	Police Department:	Newark Hazardous Material Response	973-733-7423
Alternative Hospital:	Center, West Hudson	State Police:	Port Authority of NY and NJ	973-963-7111
	Division		Newark, New Jersey	973-344-1704
	206 Bergen Avenue, Kearny, NJ 07032			
Phone:	201-955-7000			

Route and Distance to Hospital:

Attachment 1 includes listing of additional local phone numbers.

Attachment 2 includes a Study Area Location Map, proposed sampling locations, and local maps of Newark, New Jersey and Kearny, New Jersey.

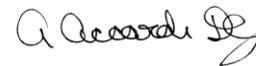
If emergency is on water, call the United States Coast Guard via cell phone or marine radio (Channel 16 VHF/FM and 2182khz HF/SSB). If necessary, proceed to Riverside County Park in Lyndhurst, New Jersey (RM10) or Riverbank Park in Kearny, New Jersey (RM7) and arrange for transportation.

HEALTH & SAFETY PLAN APPROVALS *Not valid if not signed by Corporate H&S*

PRINTED NAME

SIGNATURE

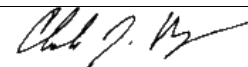
Prepared by: AmyMarie Accardi-Dey (Oversight Field Leader)



PM Signature: Len Warner



Corporate H&S: Chuck Myers



Local H&S Coordinator: Len Warner



HEALTH AND SAFETY PLAN

OBJECTIVES OF FIELD WORK: (e.g. collect surface soil samples)

1. Benthic community survey: **BOAT ACTIVITY.** A Malcolm Pirnie staff person will observe the CPG field work of the benthic community survey on the vessel operated by the CPG. When requested by the USEPA, a Malcolm Pirnie vessel operator will provide access to the site using a Malcolm Pirnie vessel to support the oversight program. Oversight tasks include: observe CPG collection of benthic community survey data, review CPG-selected sampling locations, observe the CPG deployment of in-situ bioaccumulation tests, and select 10 locations for sediment split sampling for chemical analysis and toxicity testing. Split samples will be collected by the CPG field crew and custody will be transferred to the oversight staff. Collection of split samples is addressed in Tasks 4 and 6 below.
2. Fish community survey and fish health conditions: **BOAT ACTIVITY** A Malcolm Pirnie staff person will observe the CPG field work of the fish community survey on the vessel operated by the CPG. When requested by the USEPA, a Malcolm Pirnie vessel operator will provide access to the site using a Malcolm Pirnie vessel to support the oversight program. Oversight tasks include: observe CPG collection of fish community survey data, review CPG-selected sampling locations, observe the CPG field work of fish health conditions, and select 40 samples for fish tissue split sampling for chemical analysis. Collection of split samples is address in Task 3 below.
3. Fish tissue samples: **FIELD FACILITY ACTIVITY** A Malcolm Pirnie staff person will observe the CPG field work of fish tissue collection at the field facility. Oversight tasks include: observe CPG collection of fish tissue sampling and observe CPG field work on fish stomach content taxonomy. **OFFICE ACTIVITY** Following performance of the CPG fish sample collection, Malcolm Pirnie's Sample Management Officer (or designee) will coordinate with the CPG-assigned laboratory to obtain 47 split samples of the fish tissue for analysis by the government laboratory [refer to the Oversight QAPP (Malcolm Pirnie, Inc., August 2009) for details on split sample management and shipment].
4. Laboratory toxicity testing: **FIELD FACILITY ACTIVITY.** Malcolm Pirnie Sample Management Officer or designee will coordinate the shipping of sediment split samples (for toxicity testing) to the government assigned laboratory. Samples will be packed at the field facility, and coolers will be picked up by FedEx or laboratory courier [refer to the Oversight QAPP (Malcolm Pirnie, Inc., August 2009) for details on split sample management and shipment].
5. Laboratory and In-situ bioaccumulation testing: **OFFICE ACTIVITY** Following performance of the CPG laboratory bioaccumulation tests and field in-situ bioaccumulation tests, Malcolm Pirnie's Sample Management Officer (or designee) will coordinate with the CPG-assigned laboratory to obtain 10 split samples of the benthic tissue for analysis by the government laboratory [refer to the Oversight QAPP (Malcolm Pirnie, Inc., August 2009) for details on split sample management and shipment].
6. Surface sediment samples: **FIELD FACILITY ACTIVITY.** Malcolm Pirnie Sample Management Officer or designee will coordinate the shipping of sediment split samples to the government assigned laboratory. Samples will be packed at the field facility, and coolers will be picked up by FedEx or laboratory courier [refer to the Oversight QAPP (Malcolm Pirnie, Inc., August 2009) for details on split sample management and shipment].

**** Oversight activities are designed to evaluate the CPG adherence to their RI/FS QAPP.**

Windward Environmental LLC. 2009a. "Quality Assurance Project Plan Fish And Decapod Crustacean Tissue Collection for Chemical Analysis and Fish Community Survey" Lower Passaic River Restoration Project. Prepared for the Lower Passaic River CPG. Draft version May 2009.

Windward Environmental LLC. 2009b. "Quality Assurance Project Plan Surface Sediment Chemical Analyses and Benthic Invertebrate Toxicity and Bioaccumulation Testing" Lower Passaic River Restoration Project. Prepared for the Lower Passaic River CPG. Draft version May 2009.

HEALTH AND SAFETY PLAN

SITE HISTORY: *Summarize known hazardous conditions. Include spills, previous investigations or agency actions, known injuries, etc.*

Refer to Lower Passaic River Restoration Project Work Plan (Malcolm Pirnie, Inc., August 2005) for Site history.

Refer to the Oversight Quality Assurance Project Plan for Biological Sampling, Community Surveys, and Toxicity and Bioaccumulation Testing (Malcolm Pirnie, Inc., August 2009) for details on oversight program.

On May 8, 2007, the United States Environmental Protection Agency (USEPA) announced that it had reached agreement with 73 companies considered potentially responsible for contamination in the Lower Passaic River (New Jersey) to undertake a Remedial Investigation/Feasibility Study (RI/FS) pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Superfund Amendment and Recovery Act (SARA). These parties, referred to as the Cooperating Parties Group (CPG), have retained the consultants de maximis, inc., AECOM, and Windward Environmental LLC to support them in the RI/FS effort for the lower 17.4 miles of the Passaic River. The CPG's work is closely monitored by USEPA, in consultation with the United States Army Corps of Engineers (USACE), New Jersey Department of Transportation (NJDOT), New Jersey Department of Environmental Protection (NJDEP), National Oceanic and Atmospheric Administration (NOAA), and United States Fish and Wildlife Services (USFWS). Further detail on the project background and objectives can be found at <http://www.ourPassaic.org>.

The CPG committed to conducting an initial round of fish and benthic tissue and community sampling in late summer and fall 2009 (subsequent biological sampling is anticipated in winter 2009 and spring 2010). The objective of this data collection is to support the human health and ecological risk assessments for the Lower Passaic River, as presented in the "Problem Formulation Document" (Windward Environmental, LLC, 2009a). The scope of the proposed CPG field sampling plan was based on a planning framework prepared by USEPA and the partner agencies in 2006 and referred to as "Field Sampling Plan (FSP) Volume 2" (Malcolm Pirnie, Inc., 2006). After assuming responsibility for the RI/FS, the CPG reviewed the plans prepared for FSP Volume 2 and developed and submitted their own Quality Assurance Project Plan (QAPP) documents, titled "Quality Assurance Project Plan Fish and Decapod Crustacean Tissue Collection for Chemical Analysis and Fish Community Survey" (Windward Environmental LLC, 2009b) and "Quality Assurance Project Plan Surface Sediment Chemical Analyses and Benthic Invertebrate Toxicity and Bioaccumulation Testing" (Windward Environmental LLC, 2009c).

On behalf of the USACE and USEPA, Malcolm Pirnie, Inc. will observe CPG activities and provide oversight and will collect government split samples from the CPG field sampling program (fish and benthic organisms). The oversight program is designed to provide technical review of the implementation of the CPG field sampling plan.

HEALTH AND SAFETY PLAN

SAFETY NARRATIVE: *Summarize Below*

Task 1 (benthic community survey) – BOAT ACTIVITY boating safety, immersion/drowning, heat/cold exposure, potential splash hazard, potential chemical exposure, and slip/trips/falls.

Task 2 (fish community survey and fish health) – BOAT ACTIVITY boating safety, immersion/drowning, heat exposure, potential splash hazard, potential chemical exposure, and slip/trips/falls.

Task 3 (fish tissue sampling) – FIELD FACILITY ACTIVITY slip/trip/falls, potential splash hazard, and potential chemical exposure. OFFICE ACTIVITY slip/trip/falls in the office and handling heavy objects (e.g., shipment material and coolers).

Task 4 (laboratory toxicity testing) – FIELD FACILITY ACTIVITY handling heavy objects (e.g., packed coolers and sediment buckets), potential splash hazard, potential chemical exposure, and slip/trips/falls.

Task 5 (laboratory and in-situ bioaccumulation testing) – OFFICE ACTIVITY slip/trip/falls in the office and handling heavy objects (e.g., shipment material and coolers).

Task 6 (sediment split samples) – FIELD FACILITY ACTIVITY handling heavy objects (e.g., packed coolers and sediment buckets), potential splash hazard, potential chemical exposure, and slip/trips/falls.

For Task 1 and Task 2 (boating activities):

Attachment 3 describes Malcolm Pirnie, Inc.'s boating safety procedures that will be implemented when using the Malcolm Pirnie, Inc. vessel to perform oversight work. Attachment 3 contains boating safety guidance that is broader than what will be necessary for this project; however, it contains the pertinent requirements that the oversight team is familiar with implementing. In addition to these requirements, the oversight team will assure that the following is being adhered to:

1. The vessel will be fitted with the proper United States Coast Guard safety equipment.
2. The vessel operator will conduct a safety briefing before leaving the dock and will discuss the safety and communication equipment aboard the vessel, its location, and the proper use in the event of an emergency.
3. Personal floatation devices (PFDs) will be worn while aboard the vessel.
4. Smoking will not be permitted aboard the vessel.
5. Cell phone communication will be provided, at a minimum. Marine radio will also be available and operational.
6. The vessel operator will be familiar with the navigation of the Lower Passaic River and its features.
7. The vessel operator is familiar with the location of the low clearance obstacle over Lower Passaic River and shall plan accordingly.

HEALTH AND SAFETY PLAN

8. The vessel operator and field crew shall review the predicted tides for Lower Passaic River for the day and plan accordingly to prevent being stranded as low tide approaches.
9. The crew will seek refuge in the event lightning is observed and will allow 30 minutes since the last observed lightning before returning to the site.
10. If personnel are required to transfer between vessels, then both vessels will be lashed together and not under way. At the dock, the vessel will be tied to the dock and not under way as personnel are boarding the vessel.

HEALTH AND SAFETY PLAN

PERSONNEL AND RESPONSIBILITIES	TRAINING	PROJECT OR SITE RESPONSIBILITIES	TASK
Len Warner	40 hr OSHA HAZWOPER: 05/90 8 hr Refresher (date expires): 09/08 (training in progress) Supervisor Training: 03/91	Project Manager - coordination	<input type="checkbox"/> None <input checked="" type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input checked="" type="checkbox"/> 5 <input checked="" type="checkbox"/> 6
AmyMarie Accardi-Dey	40 hr OSHA HAZWOPER: 04/04 8 hr Refresher (date expires): 11/09 Supervisor Training: 02/07	Oversight Field Leader - coordination	<input type="checkbox"/> None <input checked="" type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input checked="" type="checkbox"/> 5 <input checked="" type="checkbox"/> 6
Jim McCann	40 hr OSHA HAZWOPER: 12/04 8 hr Refresher (date expires): 02/10 Supervisor Training: 02/09	Site Quality Control Officer – quality control and audit	<input type="checkbox"/> None <input checked="" type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input checked="" type="checkbox"/> 5 <input checked="" type="checkbox"/> 6
Dave Foster	40 hr OSHA HAZWOPER: 07/05 8 hr Refresher (date expires): 03/10 USPS Certification: 11/97	Vessel Operator	<input type="checkbox"/> None <input checked="" type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6
Doug Auld	40 hr OSHA HAZWOPER: 05/91 8 hr Refresher (date expires): 03/10 USCG Certification: training in progress	Vessel Operator	<input type="checkbox"/> None <input checked="" type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6
Brian Gillen	40 hr OSHA HAZWOPER: 12/98 8 hr Refresher (date expires): 04/10	Biologist Oversight Staff Person	<input type="checkbox"/> None <input checked="" type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> 5 <input checked="" type="checkbox"/> 6
Dennis Corelli	40 hr OSHA HAZWOPER: 10/88 8 hr Refresher (date expires): 04/10	Biologist Oversight Staff Person	<input type="checkbox"/> None <input checked="" type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> 5 <input checked="" type="checkbox"/> 6
Julie Conklin	40 hr OSHA HAZWOPER: 07/04 8 hr Refresher (date expires): 05/10	Biologist Oversight Staff Person	<input type="checkbox"/> None <input checked="" type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> 5 <input checked="" type="checkbox"/> 6
Xiulan Wang	40 hr OSHA HAZWOPER: 03/08 8 hr Refresher (date expires): 03/10	Sample Management Officer – sample shipment and coordination	<input type="checkbox"/> None <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input checked="" type="checkbox"/> 5 <input checked="" type="checkbox"/> 6

HEALTH AND SAFETY PLAN

HAZARDS OF CONCERN: Check as many as applicable

<input checked="" type="checkbox"/> Animal/ Plants	<input type="checkbox"/> Dust, Harmful	<input checked="" type="checkbox"/> Heat Stress	<input type="checkbox"/> Ionizing Radiation	<input type="checkbox"/> Overhead Objects	<input checked="" type="checkbox"/> Slips & Falls
<input type="checkbox"/> Asbestos/ Lead	<input type="checkbox"/> Dust Nuisance	<input type="checkbox"/> Heavy Equipment	<input type="checkbox"/> Light Radiation (i.e., Welding, High Intensity)	<input type="checkbox"/> Oxygen Deficient	<input type="checkbox"/> Terrain
<input checked="" type="checkbox"/> Biological	<input type="checkbox"/> Electrical	<input checked="" type="checkbox"/> Heavy Lifting	<input type="checkbox"/> Limited Contact	<input checked="" type="checkbox"/> Poor Visibility	<input type="checkbox"/> Traffic (Struck by)
<input checked="" type="checkbox"/> Chemical Exposure (See Section 5B/ 5C)	<input type="checkbox"/> Excavations (See Section 13)	<input type="checkbox"/> Heavy Machinery	<input type="checkbox"/> Motorized Traffic	<input type="checkbox"/> Powered Platforms	<input checked="" type="checkbox"/> Other: (Print)
<input type="checkbox"/> Confined Space (See Section 12)	<input checked="" type="checkbox"/> Explosive/ Flammable (vessel engine)	<input type="checkbox"/> Hot Work	<input checked="" type="checkbox"/> Moving Parts (LO/TO)	<input type="checkbox"/> Radiological	<input checked="" type="checkbox"/> Oversight Program
<input type="checkbox"/> Demolition	<input checked="" type="checkbox"/> Extreme Cold	<input type="checkbox"/> Hunting Season	<input type="checkbox"/> Noise (>85dB)	<input type="checkbox"/> Rolling Objects	<input checked="" type="checkbox"/> Split Sample Collection
<input type="checkbox"/> Drilling	<input type="checkbox"/> Fall, >6' Vertical	<input checked="" type="checkbox"/> Immersion	<input type="checkbox"/> Non-Ionizing Radiation	<input type="checkbox"/> Scaffolding	<input checked="" type="checkbox"/> Vessel operation
<input type="checkbox"/> Drum Handling	<input type="checkbox"/> Falling Objects	<input type="checkbox"/> Inorganic Chemicals	<input type="checkbox"/> Organic Chemicals	<input checked="" type="checkbox"/> Sharp Objects	<input type="checkbox"/> _____

THIS PLAN INCORPORATES PROCEDURES FOR:

<input type="checkbox"/> Benzene Exposure control	<input type="checkbox"/> Electrical Safety	<input type="checkbox"/> Lead Exposure Control	<input type="checkbox"/> Respiratory Protection
<input type="checkbox"/> Bloodborne Pathogens	<input type="checkbox"/> Fall Protection/Ladders/Scaffolds	<input type="checkbox"/> Lock Out/Tag Out	<input type="checkbox"/> Trenching and Excavation Safety
<input type="checkbox"/> Cadmium Exposure Control	<input checked="" type="checkbox"/> Hazard Communication (Attachment 4)	<input checked="" type="checkbox"/> Personal Protective Equipment (Attachment 6)	<input type="checkbox"/> UXO/MEC Safety
<input type="checkbox"/> Confined Space Entry	<input checked="" type="checkbox"/> Hazardous Waste and Emergency Response (Attachment 5)	<input type="checkbox"/> Process Safety Management	<input type="checkbox"/> Welding/Cutting/ Hot Work
<input type="checkbox"/> Driver Safety	<input type="checkbox"/> Hearing Conservation	<input type="checkbox"/> Radiation Safety	<input checked="" type="checkbox"/> Boating Safety (Attachment 3)

DESCRIPTION OF SITE AND TOPOGRAPHICAL FEATURES:

Refer to Lower Passaic River Restoration Project Work Plan (Malcolm Pirnie, Inc., August 2005) for site features.

Refer to Attachment 2 for Study Area Location Map and proposed sampling locations.

SURROUNDING POPULATION:

<input checked="" type="checkbox"/> Residential	<input type="checkbox"/> Commercial	<input checked="" type="checkbox"/> Urban
<input type="checkbox"/> Rural	<input checked="" type="checkbox"/> Industrial	<input checked="" type="checkbox"/> Other (river)

HEALTH AND SAFETY PLAN

ANTICIPATED ON SITE CHEMICALS AND ESTIMATED QUANTITY					
Solids (Sediment and Tissue): (Quantity/ Concentration)	Sludge (none)	Solvent (none)	Oils (none)	Others: Decontamination Fluids	
Flyash none				Acids	None
Mill or Mine none				Picking	None
Tailings none				Liquors	None
Asbestos none				Caustics	None
Ferrous Smelter none				Pesticides	None
Non-Ferrous Smelter none				Dyes or Inks	None
Metals See below				Cyanides	None
Dioxins See below				Phenols	None
Others- Specify				Halogens	None
<u>Sediment contamination and fish/benthic tissue contamination – refer to “known contaminant” concentrations listed below</u>				Others- Specify	Refer to the CPG QAPP for decontamination process. Oversight staff should stand at least 10 feet from decontamination process to avoid potential splashing.
ANTICIPATED WASTE TYPES: <input type="checkbox"/> Liquid <input type="checkbox"/> Sludge <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Solid <input type="checkbox"/> Gas <input type="checkbox"/> Other: _____					
FACILITY PAST AND PRESENT DISPOSAL METHODS AND PRACTICES, IF APPLICABLE: The oversight program will <u>not</u> generate investigative derived-waste (IDW). Disposal personal protection equipment (PPE) can be placed in municipal garbage.					

HEALTH AND SAFETY PLAN

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION (Which media?)	8 HR TIME WEIGHTED AVERAGE IN AIR (PEL/TLV) Specify Units	IDLH Specify Units	WARNING CONCENTRATION IF ANY Specify Units	SYMPTOMS & EFFECTS OF ACUTE EXPOSURE	MEDIA	PHOTO-IONIZATION POTENTIAL (FOR VOCs)
Mercury	1.8 mg/kg (average surface sediment)	NIOSH Mercury Vapor 0.05 mg/m3	10 mg/m3 as mercury	NA	Irritated eyes and skin; cough; chest pains	Air	NA
Lead	210 mg/kg (average surface sediment)	NIOSH 0.05 mg/m3	100 mg/m3 as lead	NA	Abdominal pains; irritated eyes	Air	NA
DDE	54 ug/kg (average surface sediment)	NIOSH 0.5 mg/m3	Ca [500 mg/m3]	NA	Irritated eyes and skin; dizzy	Air	NA
2,3,7,8-TCDD	280 ng/kg (average surface sediment)	Not available	Not available	NA	Irritated eyes	Air	NA
Pyrene	6.1 mg/kg (average surface sediment)	Coal tar pitch volatiles 0.1 mg/m3	Ca [80 mg/m3]	NA	Irritated skin	Air	NA
NA = Not Available NE = None Established U = Unknown S = Soil SW = Surface Water A = Air GW = Ground Water W = Waste L = Lagoons D = Drums TK = Tanks							
Attached a Material Safety Data Sheet for each chemical you will use at the site							

HEALTH AND SAFETY PLAN

SPECIFIC TASK DESCRIPTIONS	TASK – SPECIFIC HAZARDS	CONTROL MECHANISM
1. Task 1: Benthic Community Survey	BOAT ACTIVITY boating safety, immersion/drowning, heat exposure, potential splash hazard, potential chemical exposure, and slip/trips/falls	PPE including PFD Extra clothing to protect from elements when on the vessel. Mustang suits when water temperature is <50F.
2. Task 2: Fish Community Survey and Fish Health Conditions	BOAT ACTIVITY boating safety, immersion/drowning, heat exposure, potential splash hazard, potential chemical exposure, and slip/trips/falls	PPE including PFD Extra clothing to protect from elements when on the vessel. Mustang suits when water temperature is <50F.
3. Task 3: Fish Tissue Samples	FIELD FACILITY ACTIVITY slip/trip/falls, potential splash hazard, and potential chemical exposure OFFICE ACTIVITY slip/trip/falls in the office and handling heavy objects (e.g., shipment material and coolers)	PPE and remain outside the exclusion zone. Split samples will be collected by the CPG field crew and transferred to oversight staff.
4. Task 4: Laboratory Toxicity Testing	FIELD FACILITY ACTIVITY handling heavy objects (e.g., packed coolers and sediment buckets), potential splash hazard, potential chemical exposure, and slip/trips/falls	PPE and remain outside the exclusion zone. Split samples will be collected by the CPG field crew and transferred to oversight staff.
5. Task 5: Laboratory and In-situ Bioaccumulation Testing	OFFICE ACTIVITY slip/trip/falls in the office and handling heavy objects (e.g., shipment material and coolers)	PPE Split samples will be collected and shipped by the CPG-assigned laboratory
6. Task 6: Surface Sediment Samples	FIELD FACILITY ACTIVITY handling heavy objects (e.g., packed coolers and sediment buckets), potential splash hazard, potential chemical exposure, and slip/trips/falls	PPE and remain outside the exclusion zone. Split samples will be collected by the CPG field crew and transferred to oversight staff.

HEALTH AND SAFETY PLAN

SPECIALIZED TRAINING REQUIRED: 40 hr OSHA HAZWOPER Training and 8 hr Refresher Vessel Operator – USCG Certification	SPECIAL MEDICAL SURVEILLANCE REQUIEREMENTS: Medical surveillance as part of the 40 hr OSHA HAZWOPER
OVERALL HAZARD EVALUATON: <i>(Evaluate each Hazard)</i> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <input type="checkbox"/> High <input type="checkbox"/> Medium <input checked="" type="checkbox"/> Low <input type="checkbox"/> Unknown </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 48%;"> 1. Oversight program (Hazard Analysis provided in Attachment 7) 2. 3. </div> <div style="width: 48%;"> 4. 5. 6. </div> </div>	
JUSTIFICATION: <i>(i.e. why is the task a low, medium or high hazard?)</i> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div style="width: 48%;"> 1. Oversight program only – primarily observations and not direct field work; however, boating safety requires vigilance. 2. 3. </div> <div style="width: 48%;"> 4. 5. 6. </div> </div>	
FIRE/ EXPLOSION POTENTIAL: <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <input type="checkbox"/> High <input type="checkbox"/> Medium <input checked="" type="checkbox"/> Low <input type="checkbox"/> Unknown </div> <p>Work will take place on vessels carrying flammable fuel and powered by outboard motors.</p>	

HEALTH AND SAFETY PLAN

PROTECTIVE EQUIPMENT <i>Specify by task. Indicate type and / or material, as necessary. Group tasks if possible. Use copies of this sheet if needed.</i>			
Task 1 and 2	LEVEL: <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input checked="" type="checkbox"/> Modified <input checked="" type="checkbox"/> Primary <input type="checkbox"/> Contingency FOR BOAT ACTIVITY	Task 3, 4, and 6	LEVEL: <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input checked="" type="checkbox"/> Modified <input checked="" type="checkbox"/> Primary <input type="checkbox"/> Contingency FOR FIELD FACILITY ACTIVITY
Respiratory <input checked="" type="checkbox"/> Not Needed <input type="checkbox"/> SCBA <input type="checkbox"/> Airline <input type="checkbox"/> Full Face Specify Cartridge: _____ <input type="checkbox"/> Escape Mask <input type="checkbox"/> Other: <i>Specify</i> _____	Protective Clothing <input type="checkbox"/> Not Needed <input type="checkbox"/> Fully Encapsulating Suit <input type="checkbox"/> Splash Suite <input type="checkbox"/> Tyvek Coverall <input type="checkbox"/> Saranex Coverall <input type="checkbox"/> Reflective Vest <input checked="" type="checkbox"/> Other: <i>Specify</i> <u>Personal Flotation Device</u>	Respiratory <input checked="" type="checkbox"/> Not Needed <input type="checkbox"/> SCBA <input type="checkbox"/> Airline <input type="checkbox"/> Full Face Specify Cartridge: _____ <input type="checkbox"/> Escape Mask <input type="checkbox"/> Other: <i>Specify</i> _____	Protective Clothing <input type="checkbox"/> Not Needed <input type="checkbox"/> Fully Encapsulating Suit <input type="checkbox"/> Splash Suite <input type="checkbox"/> Tyvek Coverall <input type="checkbox"/> Saranex Coverall <input type="checkbox"/> Reflective Vest <input checked="" type="checkbox"/> Other: <i>Specify</i> <u>Tyvek apron</u>
Head and Eye <input type="checkbox"/> Not Needed <input checked="" type="checkbox"/> Safety Glasses <input type="checkbox"/> Face Shield <input type="checkbox"/> Goggles <input type="checkbox"/> Hard Hat <input checked="" type="checkbox"/> Other Sunglasses	Gloves <input type="checkbox"/> Not Needed <input checked="" type="checkbox"/> Nitrile <input checked="" type="checkbox"/> Work Gloves <input type="checkbox"/> Latex <input type="checkbox"/> Viton <input type="checkbox"/> Other: <i>Specify</i> _____	Head and Eye <input type="checkbox"/> Not Needed <input checked="" type="checkbox"/> Safety Glasses <input type="checkbox"/> Face Shield <input type="checkbox"/> Goggles <input type="checkbox"/> Hard Hat <input type="checkbox"/> Other	Gloves <input type="checkbox"/> Not Needed <input checked="" type="checkbox"/> Nitrile <input type="checkbox"/> Work Gloves <input type="checkbox"/> Latex <input type="checkbox"/> Viton <input type="checkbox"/> Other: <i>Specify</i> _____
Boots <input type="checkbox"/> Not Needed <input checked="" type="checkbox"/> Leather/Steel Toe <input type="checkbox"/> Rubber Overboots <input type="checkbox"/> Steel Shank <input type="checkbox"/> Other: <i>Specify</i> _____	Miscellaneous <input checked="" type="checkbox"/> Insect Repellent <input checked="" type="checkbox"/> USCG <i>Personal Flotation Device</i> <input type="checkbox"/> Hearing <i>Specify NRR</i> _____ <input checked="" type="checkbox"/> Sun Screen <input type="checkbox"/> Other: <i>Specify</i> _____	Boots <input type="checkbox"/> Not Needed <input checked="" type="checkbox"/> Leather/Steel Toe <input type="checkbox"/> Rubber Overboots <input type="checkbox"/> Steel Shank <input type="checkbox"/> Other: <i>Specify</i> _____	Miscellaneous <input checked="" type="checkbox"/> Not Needed <input type="checkbox"/> Insect Repellent <input type="checkbox"/> USCG <i>Personal Flotation Device</i> <input type="checkbox"/> Hearing <i>Specify NRR</i> _____ <input type="checkbox"/> Sun Screen <input type="checkbox"/> Other: <i>Specify</i> _____

Extra clothing is required to protect from elements when on the vessel.
Mustang suit is required when water temperature is <50F.

HEALTH AND SAFETY PLAN

Task 3, 4, 5, and 6	LEVEL: <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input checked="" type="checkbox"/> Modified <input checked="" type="checkbox"/> Primary <input type="checkbox"/> Contingency			
	FOR SAMPLE MANAGEMENT			
	Respiratory <input checked="" type="checkbox"/> Not Needed <input type="checkbox"/> SCBA <input type="checkbox"/> Airline <input type="checkbox"/> Full Face Specify Cartridge: _____ <input type="checkbox"/> Escape Mask <input type="checkbox"/> Other: <i>Specify</i> _____	Protective Clothing <input checked="" type="checkbox"/> Not Needed <input type="checkbox"/> Fully Encapsulating Suit <input type="checkbox"/> Splash Suite <input type="checkbox"/> Tyvek Coverall <input type="checkbox"/> Saranex Coverall <input type="checkbox"/> Reflective Vest <input type="checkbox"/> Other: <i>Specify</i> _____		
	Head and Eye <input type="checkbox"/> Not Needed <input checked="" type="checkbox"/> Safety Glasses <input type="checkbox"/> Face Shield <input type="checkbox"/> Goggles <input type="checkbox"/> Hard Hat <input type="checkbox"/> Other	Gloves <input type="checkbox"/> Not Needed <input checked="" type="checkbox"/> Nitrile <input type="checkbox"/> Work Gloves <input type="checkbox"/> Latex <input type="checkbox"/> Viton <input type="checkbox"/> Other: <i>Specify</i> _____		
Boots <input type="checkbox"/> Not Needed <input checked="" type="checkbox"/> Leather/Steel Toe <input type="checkbox"/> Rubber Overboots <input type="checkbox"/> Steel Shank <input type="checkbox"/> Other: <i>Specify</i> _____	Miscellaneous <input checked="" type="checkbox"/> Not Needed <input type="checkbox"/> Insect Repellent <input type="checkbox"/> USCG <i>Personal Flotation Device</i> <input type="checkbox"/> Hearing <i>Specify NRR</i> _____ <input type="checkbox"/> Sun Screen			

HEALTH AND SAFETY PLAN

MONITORING NOT REQUIRED FOR OVERSIGHT PROGRAM

MONITORING EQUIPMENT: Specify by task. Indicate type as necessary. Attach Additional sheets if needed.			
INSTRUMENT	ACTION GUIDELINES		
Combustible Gas Indicator	0-10% LEL 10-25% LEL >25% LEL	No explosion hazard Potential explosion hazard. Reconsider Work Plan. Proceed Cautiously Explosion hazard. Evacuate Immediately. Warn Others.	<input checked="" type="checkbox"/> Not Needed
Oxygen Indicator	19.5-23.5 % < 19.5% >23.5 %	Oxygen normal Oxygen deficient. Evacuate Immediately. Warn Others. Explosion hazard. Evacuate Immediately. Warn Others.	<input checked="" type="checkbox"/> Not Needed
Radiation Survey Meter	3 x Background: >2mR/hr:	Notify RSO if unanticipated. Withdraw and await instructions Establish Rad Exclusion Zone	<input checked="" type="checkbox"/> Not Needed
Photo ionization Detector ____eV Lamp Type: ____	0-3 units over ambient 3-5 units over ambient >5 units over ambient	0-3 meter units over background, continue work If sustained for 5 minutes--reconsider work plan. Proceed with caution. If sustained for 5 minutes--evacuate or don respiratory protection	<input checked="" type="checkbox"/> Not Needed
Flame Ionization Detector Type ____	0-3 units over ambient 3-5 units over ambient >5 units over ambient	0-3 meter units over background, continue work If sustained for 5 minutes--reconsider work plan. Proceed with caution. If sustained for 5 minutes--evacuate or don respiratory protection	<input checked="" type="checkbox"/> Not Needed
Combustible Gas Indicator			
Single Gas Type ____	Specify:		<input checked="" type="checkbox"/> Not Needed
Respirable Dust Monitor Type ____	Specify:		<input checked="" type="checkbox"/> Not Needed
Other Specify: ____ Type ____	Specify:		<input type="checkbox"/> Not Needed

HEALTH AND SAFETY PLAN

DECONTAMINATION PROCEDURES		
ATTACH SITE MAP INDICATING EXCLUSION, DECONTAMINATION, & SUPPORT ZONES		
Personnel Decontamination <i>Summarize below or attach diagram.</i> <i>Place disposable PPE in municipal garbage and wash hands.</i> <div style="text-align: right;"><input type="checkbox"/> Not Needed</div>	Exclusion Zone <i>Summarize below or attach diagram.</i> <div style="text-align: right;"><input checked="" type="checkbox"/> Not Needed</div>	Sampling Equipment Decontamination <i>Summarize below or attach diagram.</i> <i>Refer to the CPG QAPP for decontamination process. Oversight staff should stand at least 10 feet from decontamination process to avoid potential splashing.</i> <div style="text-align: right;"><input checked="" type="checkbox"/> Not Needed</div>
Containment and Disposal Method <i>Place disposable PPE in municipal garbage.</i> <div style="text-align: right;"><input type="checkbox"/> Not Needed</div>	Containment and Disposal Method <div style="text-align: right;"><input checked="" type="checkbox"/> Not Needed</div>	Containment and Disposal Method <div style="text-align: right;"><input checked="" type="checkbox"/> Not Needed</div>
HAZARDOUS MATERIALS TO BE BROUGHT TO ONSITE		
<i>Preservatives (NONE)</i> <input type="checkbox"/> Hydrochloric Acid <input type="checkbox"/> Zinc Acetate <input type="checkbox"/> Nitric Acid <input type="checkbox"/> Ascorbic Acid <input type="checkbox"/> Sulfuric Acid <input type="checkbox"/> Acetic Acid <input type="checkbox"/> Sodium Hydroxide <input type="checkbox"/> Other:	<i>Decontamination (NONE)</i> <input type="checkbox"/> Alconox™ <input type="checkbox"/> Mineral Spirits <input type="checkbox"/> Liquinox™ <input type="checkbox"/> Hexane <input type="checkbox"/> Acetone <input type="checkbox"/> Isopropanol <input type="checkbox"/> Methanol <input type="checkbox"/> Nitric Acid <input type="checkbox"/> Other: <input type="checkbox"/> Other: _____	<i>Calibration (NONE)</i> <input type="checkbox"/> 100 ppm isobutylene <input type="checkbox"/> Hydrogen Sulfide <input type="checkbox"/> Methane <input type="checkbox"/> Carbon Monoxide <input type="checkbox"/> Pentane <input type="checkbox"/> pH Standards <input type="checkbox"/> Hydrogen <input type="checkbox"/> Conductivity <input type="checkbox"/> Propane <input type="checkbox"/> Other: _____

HEALTH AND SAFETY PLAN

SITE MAP: *Show Exclusion Zone, Contamination Reduction Zone, and Support Zones. Indicate Evacuation and Reassembly Points*

Refer to Attachment 2 which includes a map of sampling locations (reprint from Windward Environmental LLC. 2009. "Quality Assurance Project Plan Fish And Decapod Crustacean Tissue Collection for Chemical Analysis and Fish Community Survey." Lower Passaic River Restoration Project. Prepared for the Lower Passaic River CPG, and Windward Environmental LLC. 2009. "Quality Assurance Project Plan Surface Sediment Chemical Analyses and Benthic Invertebrate Toxicity and Bioaccumulation Testing." Lower Passaic River Restoration Project. Prepared for the Lower Passaic River CPG.)

Oversight staff will remain outside the exclusion zone at the CPG-assigned field facility.



HEALTH AND SAFETY PLAN

HEALTH AND SAFETY PLAN SIGNATURE FORM

Malcolm Pirnie Health and Safety Plan

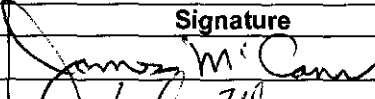
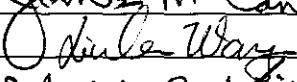
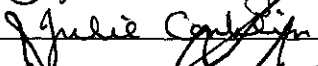

All on-site Malcolm Pirnie personnel must sign this form indicating receipt of the HASP. Keep this original in site as part of the permanent project files. Send a copy to the Health and Safety Lead for your BU.

SITE NAME: Lower Passaic River Restoration Project – Oversight for Biological Sampling, Community Surveys, and Toxicity and Bioaccumulation Testing

SITE LOCATION: Lower Passaic River - New Jersey

CERTIFICATION

I understand that I am responsible for my safety and that of others. I agree to comply with the provisions of this HASP for work activities on this project. I agree to report any injuries, illnesses or exposure incidents to the Field Team Leader.

Printed Name	Signature
JAMES MCCANN	
Xiulan Wang	
Julie Conklin	
DOUGLAS AULD	

Printed Name	Signature



All requirements of the Pirnie Health and Safety Program
Are Incorporated into this Document by Reference

HEALTH AND SAFETY PLAN

HEALTH AND SAFETY PLAN SIGNATURE FORM

Malcolm Pirnie Health and Safety Plan

All on-site Malcolm Pirnie personnel must sign this form indicating receipt of the HASP. Keep this original in site as part of the permanent project files. Send a copy to the Health and Safety Lead for your BU.

SITE NAME: Lower Passaic River Restoration Project – Oversight for Biological Sampling, Community Surveys, and Toxicity and Bioaccumulation Testing

SITE LOCATION: Lower Passaic River - New Jersey

CERTIFICATION

I understand that I am responsible for my safety and that of others. I agree to comply with the provisions of this HASP for work activities on this project. I agree to report any injuries, illnesses or exposure incidents to the Field Team Leader.

Printed Name	Signature
Brian J. Gillen	Brian J. Gillen
Dennis Corelli	Dennis Corelli
DAVID FOSTER	David Foster

Printed Name	Signature

Attachment 1

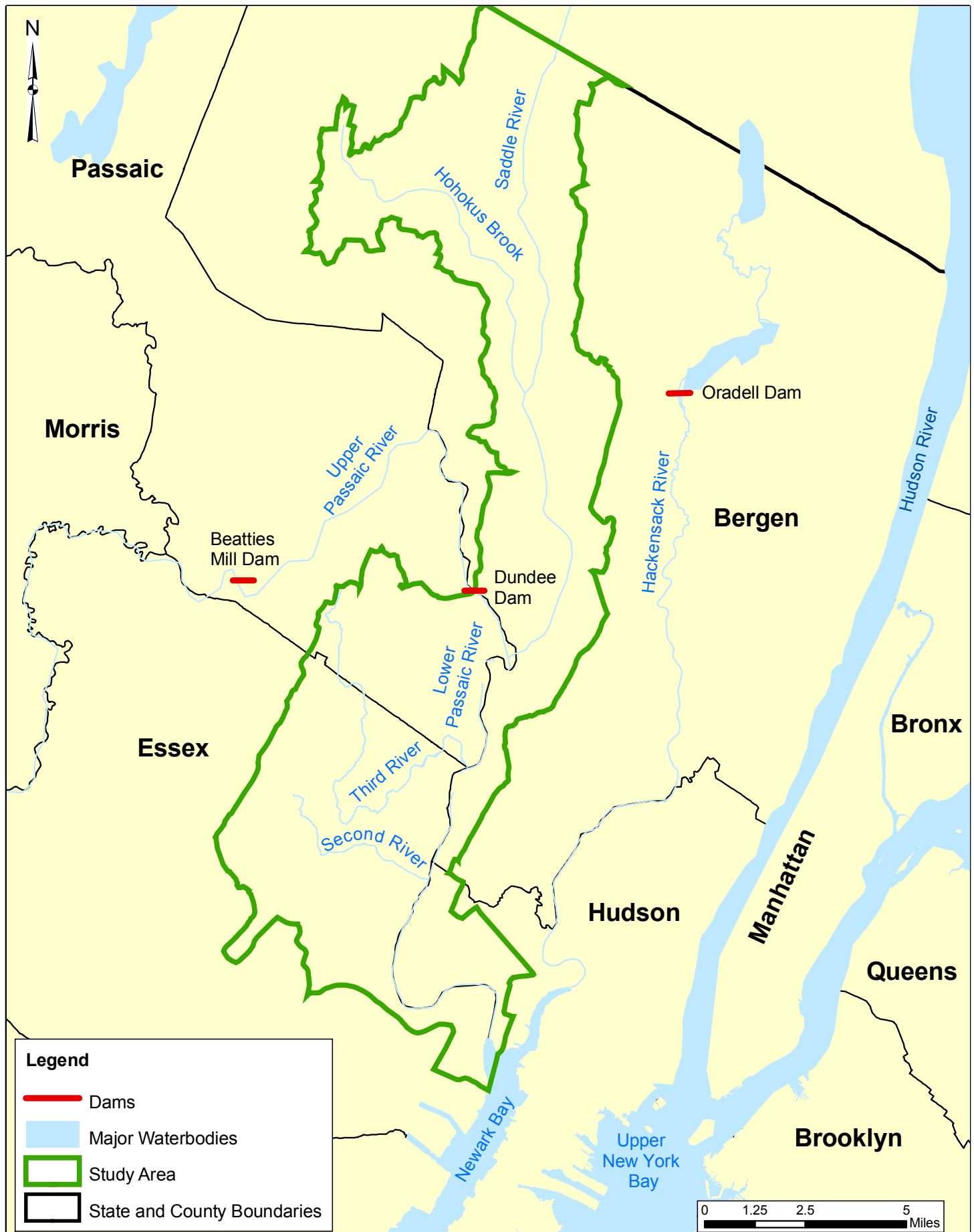
Local Phone Numbers and Contacts
for the Lower Passaic River Restoration Project

CONTACT	TELEPHONE NUMBER
GENERAL/FEDERAL/STATE	
Emergency Response (Fire, Police, Medical, etc.)	911
Poison Control Center	(800) 336-6997
United States Coast Guard	(718) 354-4119
National Response Center and Terrorist Hotline	(800) 424-8802
USACE Project Manager: Beth Buckrucker	(816) 983-3581
USEPA Project Manager: Stephanie Vagn	(212) 637-3914
New Jersey State Police	(609) 882-2000 (Headquarters, West Trenton) (973) 344-1704 (Newark)
New Jersey Department of Environmental Protection	(877) 927-6337 (24-hour Emergency Control Center)
Port Authority of NY & NJ - Police, Central Police Desk	(973) 963-7111
BERGEN COUNTY	
Bergen County Police Department	(201) 646-2700 (Headquarters) (201) 634-3100 (Emergency Management)
City of Garfield	
Garfield Police Department	911 (Emergency) (973) 478-8500
Garfield Fire Department	911 (Emergency) (973) 478-8815 (Non-Emergency)
Township of Lyndhurst	
Lyndhurst Police Department	911 (Emergency) (201) 939-2900 (Non-Emergency)
Lyndhurst Fire Department	911 (Emergency) (201) 804-2441 (Non-Emergency)
Borough of North Arlington	
North Arlington Police Department	911 (Emergency) (201) 991-4400 (Non-Emergency)
North Arlington Fire Department	911 (Emergency) (201) 955-5633 (Non-Emergency)
North Arlington Emergency Squad	911 (Emergency) (201) 955-5647 (Non-Emergency)
Borough of Rutherford	
Rutherford Police Department	911 (Emergency) (201) 939-6000 (Non-Emergency)
Rutherford Fire Department	911 (Emergency) (201) 939-6000 (Non-Emergency)
Ambulance Corp	911 (Emergency) (201) 939-8241 (Non-Emergency)
Borough of Wallington	
Wallington Police Department	911 (Emergency)
Wallington Fire Department	911 (Emergency) (973) 473-1715 (Non-Emergency)

CONTACT	TELEPHONE NUMBER
ESSEX COUNTY	
Essex County Sheriff's Office	(973) 621-4105
Essex County Police (County Police)	(973) 268-4200
Essex County Emergency Special Services	(973) 733-4645
Township of Belleville	
Belleville Police Department	(973) 450-3333
Belleville Fire Department	(973) 450-3366
City of Newark	
Newark Police Department	(973) 733-6000
Newark Fire Department (Main)	(973) 733-7424
Newark Fire Department (Emergency Management)	(973) 733-3660
Newark Fire Department, (Hazardous Materials Response)	(973) 733-7423
Township of Nutley	
Nutley Police Department	911 (Emergency)
Nutley Fire Department	911 (Emergency)
HUDSON COUNTY	
Hudson County Sheriff's Office	(201) 915-1300 (Patrol Bureau)
Township of Harrison	
Harrison Police Department	911 (Emergency) (973) 589-0911 (Emergency) (973) 478-6839 (Non-Emergency)
Harrison Fire, Ambulance	911 (Emergency) or (973) 589-0911 (Emergency)
Ewan Volunteer Fire Company	911 (Emergency) (856) 478-2261 (Non-Emergency)
Harrison Emergency Management	(973) 478-4105
Township of Kearny	
Kearny Police Department	911 (Emergency) (201) 998-1313 (Non-Emergency)
Kearny Fire Department	911 (Emergency) (201) 991-1402 (Non-Emergency)
PASSAIC COUNTY	
Passaic County Sheriff's Office	(973) 881-7500
City of Clifton	
Clifton Police Department	911 (Emergency) (973) 470-5900 (Non-Emergency)
Clifton Fire Department	911 (Emergency) (973) 470-5801/5900 (Non-Emergency)
City of Passaic	
Passaic Police Department	911 (Emergency)
Passaic Fire Department	911 (Emergency)

Attachment 2

Maps and Proposed Sampling Locations



Map Document: (S:\Projects\PASSAIC\MapDocuments\4622001-WRDAMXD\FSP2_033106\WDXS\Introduction\site\location.mxd)
5/10/2006 - 5:55:27 PM

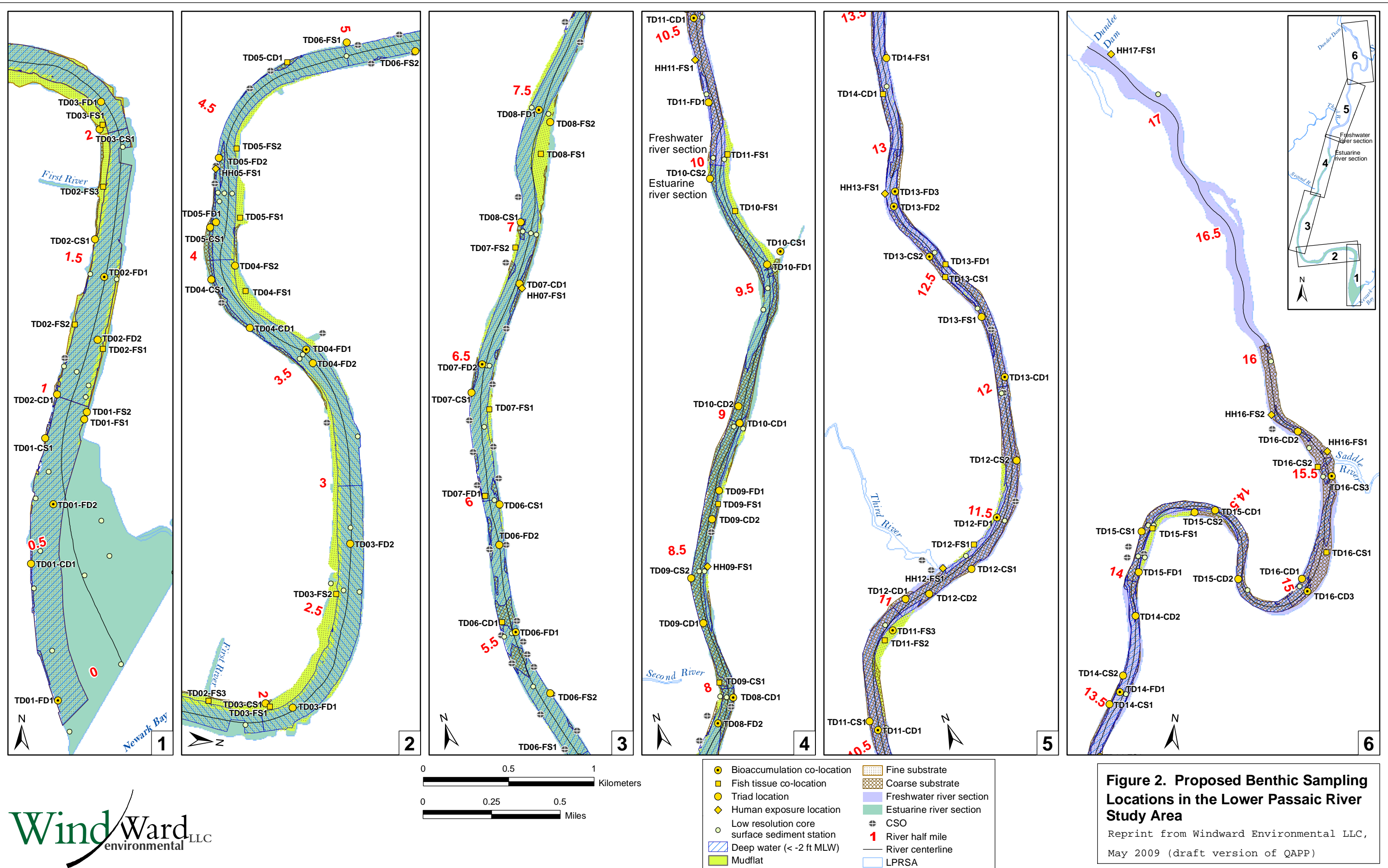


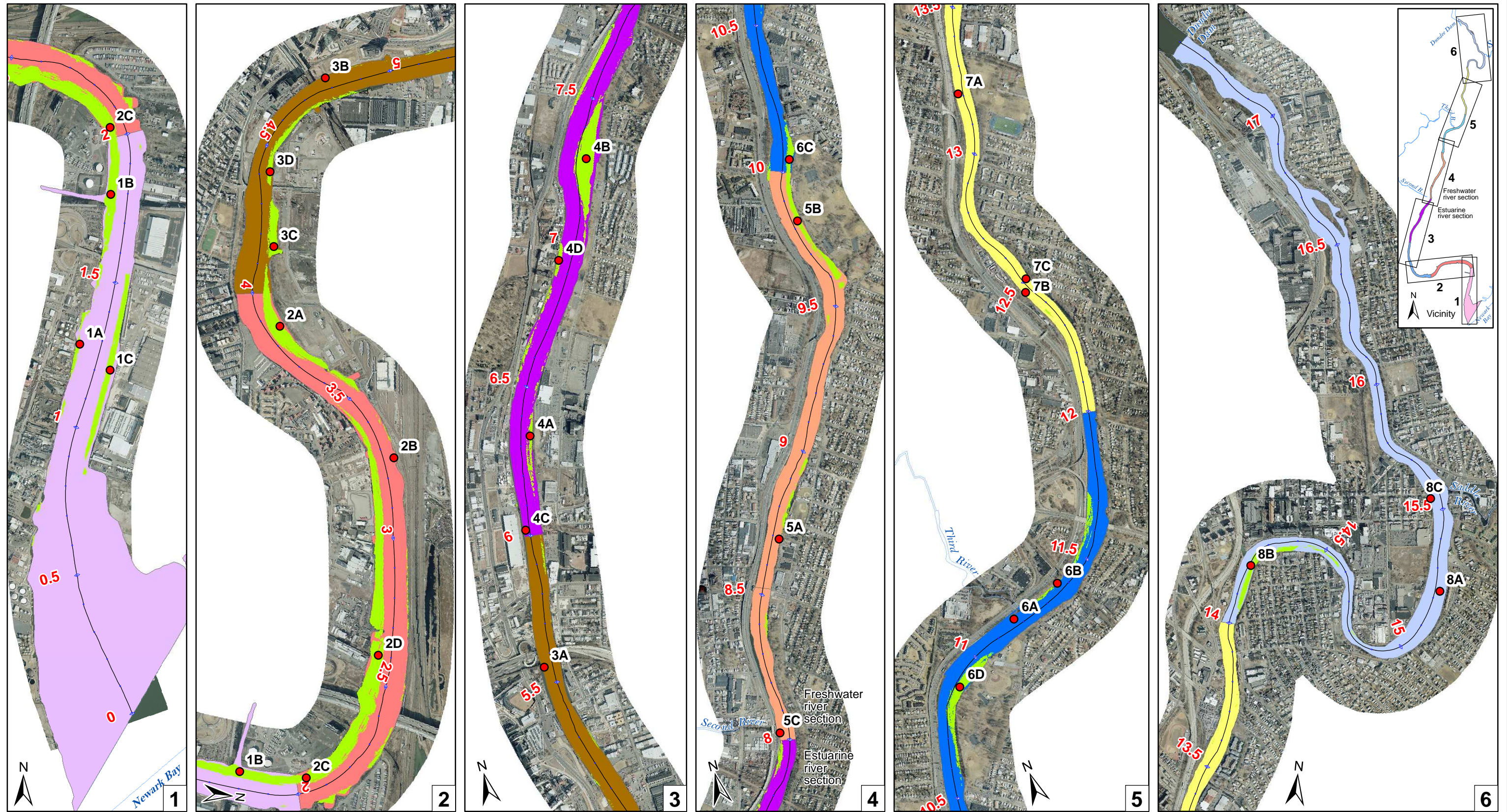
Study Area Location Map

Lower Passaic River Restoration Project

Figure 1

August 2009





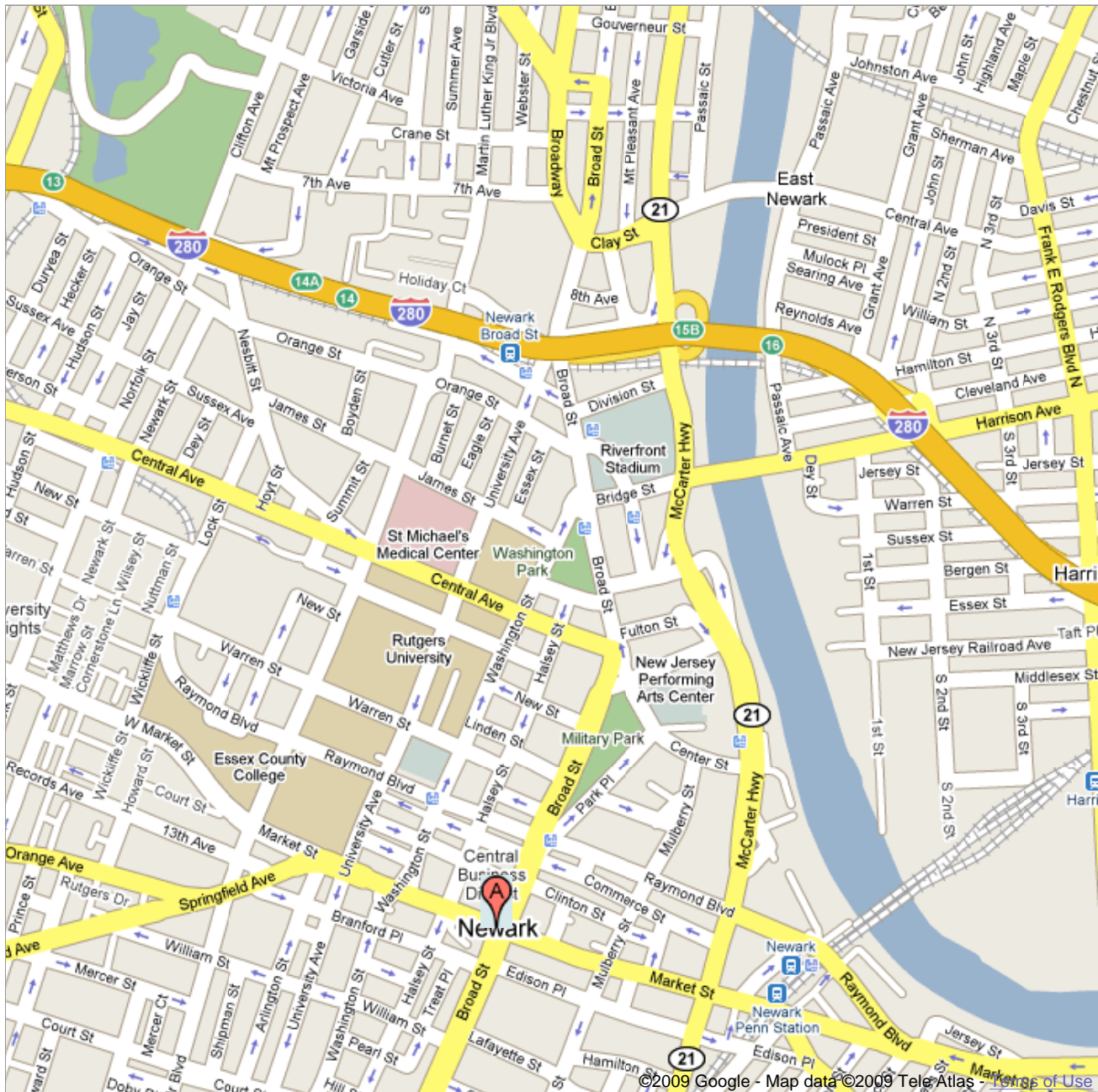
Proposed sampling reach	Freshwater zone	Potential fish and decapod sampling location*
Estuarine zone	RM 8-10	— River centerline
RM 0-2	RM 10-12	— Mudflat
RM 2-4	RM 12-14	— LPRSA
RM 4-6	RM 14-17.4	
RM 6-8		

* Additional locations may be selected based on field observations or conditions.
Identified locations are approximate and may vary to account for impediments and river conditions.

Figure 3. Proposed Fish Community and Tissue Sampling Locations in the Lower Passaic River Study Area
Reprint from Windward Environmental LLC,
May 2009 (draft version of QAPP)
DRAFT - SUBJECT TO REVISION

Address **Newark, NJ**

Notes St. Michael's Medical Center
 268 Dr. Martin Luther King Jr
 Blvd, Newark, NJ 07102
 973-268-8000
 973-690-3518





Claara Maass Medical Center, West Hudson Division, near 206 Bergen Ave, Kearny, NJ 07032

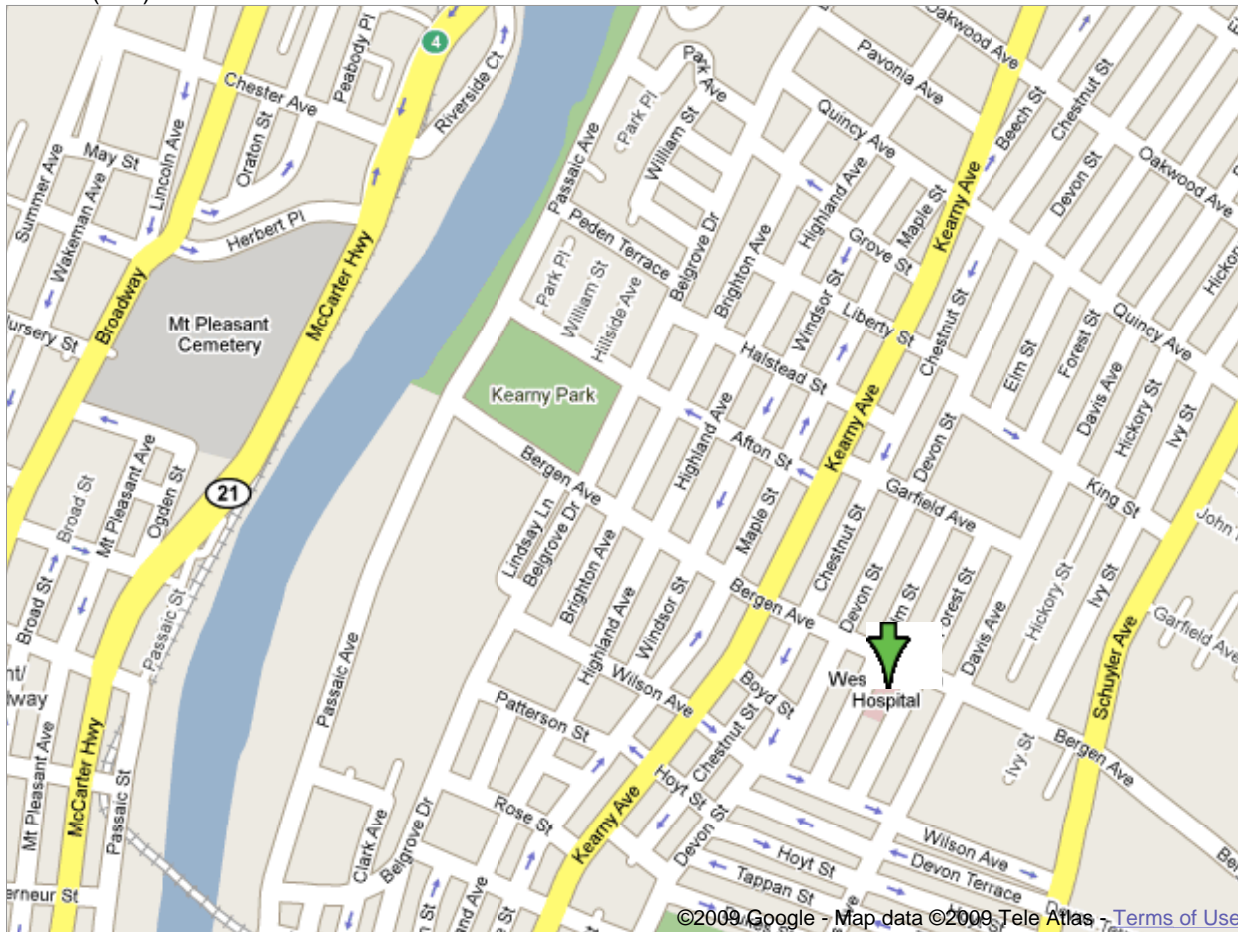
Get Google Maps on your phone



Text the word "GMAPS" to 466453

A. Clara Maass Medical Center West Hudson Division

206 Bergen Avenue, Kearny, NJ -
(201) 955-7000 - 0.1 mi N



Attachment 3

Boating Safety

Boating Safety

Fieldwork that requires using vessels in Lower Passaic River and tributaries will be coordinated the United States Army Corps of Engineers (USACE) and United State Environmental Protection Agency (USEPA) or its designee. All vessels associated with the field activities will monitor the United States Coast Guard (USCG) on Marine Band Radio, Channel 16. Operators of local bridges will be notified on a daily basis of the likely location of field activities on the river. No work is anticipated to be performed on the river after dusk or before dawn. While performing fieldwork within the designated navigational channel proper, the boats will station buoys to clearly denote the area in which other boats may freely navigate. The navigational channel will not be completely blocked during fieldwork and vessels associated with the field activities will yield to other vessels that may need to pass. Additionally, fieldwork on the river will not occur if visibility is less than 200 feet at that given location.

Contractor personnel working over, adjacent, or near water, or where the danger of drowning exists, must wear a USCG-approved life jacket or buoyant work vests. Prior to and after each use, the buoyant work vests or life preservers must be inspected for defects, which would alter their strength and buoyancy. Defective units must be removed from service. Ring buoys with at least 90 feet of line must be provided and readily available for emergency rescue operations. Distance from ring buoys may not exceed 200 feet. Some means of rescue (*e.g.*, a ring buoy or boat) must be immediately available at locations where personnel are working over or adjacent to water.

Hazards

Working from a boat presents obvious hazards, including drowning, but several other hazards exist. Powered boats carry a fuel supply with the potential for fire or explosion if vapors accumulate and reach an ignition source. Weather, currents, and other watercraft may also pose significant hazards to the crew.

Control Measures

In land-based field operations, proper training and equipment are essential to completing field tasks efficiently and safely. This procedure also holds true for operations conducted on or adjacent to bodies of water. The type of boats to be utilized may include Boston Whalers, “Zodiac” boats, “Jon” boats, pontoon boats, and small powerboats (less than 20 feet long).

The operator/skipper of each boat must complete a USCG-certified boating safety training course prior to conducting work on the river. Each employee working from a boat is required to participate in a boating safety training session conducted during the daily safety meeting. The training session must provide instruction on the following topics:

- Proper boat and safety equipment inspections.
- Content and frequency of equipment safety inspections.

- Proper use of on-board safety equipment, including fire extinguisher, radio or cellular phone, flares, horn, *etc.*
- Proper procedures on the completion and filing of a float plan.
- Appropriate boating “rules-of-the-river”.
- Emergency procedures in the event of capsizing or being thrown overboard.
- Personal flotation devices (PFDs) and their proper inspection and use.

Prior to each day or shift of operations, a boat inspection must be conducted by the boat operator/skipper. This inspection must be conducted in accordance with accepted USCG and any applicable state boating safety inspection procedures. The inspection must verify that necessary safety equipment is aboard, functioning properly, and all members of the crew are aware of proper procedures that are to be followed upon the water. In addition, this information must be reviewed during the daily tailgate safety meeting to confirm that the procedures have been followed and all crew members are satisfied as to its completion.

It will be the responsibility of the vessel captain to verify that daily boat/equipment inspections are completed and documented, and daily tailgate safety meetings are conducted. The following safety procedures must be followed at all times:

- Boat(s) must not be overloaded with equipment or personnel.
- Loads must be distributed evenly throughout the boat.
- A Type III PFD (*e.g.*, life jacket or life vest) must be worn at all times when working on or adjacent to the water.
- Prior to each use, the PFD or work vest must be inspected for defects that may alter its strength or buoyancy. PFDs must also be properly inspected to confirm that appropriate USCG approvals and ratings information is available. Defective units must be tagged “DO NOT USE” and removed from service.
- At least one throwable PFD (*e.g.*, seat cushion or ring buoy) must be available on board each boat.
- In addition to PFDs, personnel who are working in boats over water when the sum of the air temperature and water temperature is less than 90 degrees Fahrenheit (°F), must be equipped with thermal protective clothing/equipment (wet suits, dry suits, or survival suits). The thermal protective clothing must be adequate to protect personnel from hypothermic effects of immersion in water at the temperatures encountered.
- Sampling activities may be done using hip waders and the required level of PPE. Waders must be inspected prior to donning for holes, punctures, tears, or any other defect (*i.e.*, missing straps) that would allow water to enter. In addition to drowning and other hazards associated with working on or near the water, there exists the possibility for slips, trips, or falls caused by slippery, unstable, and irregular walking surfaces. Waders used for sampling activities must be properly sized and provide the wearer with adequate traction.
- An audible signal/alarm (audible at up to ½ mile away) must be maintained in each boat.

- Each boat must be equipped with a ship-to-shore radio, cellular phone, and/or “walkie-talkie” capable of contacting the USCG, marine police, or other on-shore station to call for help in an emergency.
- Each boat must be equipped with some type of visual display signal/device (*e.g.*, flares or appropriate distress flag).
- All powerboats must have a valid state registration. This registration must be maintained on the boat, and as necessary be made available for USCG or marine police inspection.
- At a minimum, each powerboat must be equipped with a Type 4-A, 10-B, C-rated fire extinguisher.
- Boats may not be operated at night without proper lighting and the capability for making visual distress signals.
- The “buddy system” will be strictly adhered to during any water-related activities. At no time will anyone enter the water or conduct boating activities without another individual readily available to contact emergency services.

Clean Boating – How to do Your Part
From the Maryland Clean Marina Initiative
Maryland Department of Natural Resources
http://www.boatsafe.com/nauticalknowhow/clean_boating.htm

Environmental Concerns:

Petroleum in or on the water is harmful and, in some cases, fatal to aquatic life. Benzene, a carcinogen, is in gasoline. Oil contains zinc, sulfur, and phosphorous.

Once petroleum is introduced into the water, it may float at the surface, evaporate into the air, become suspended in the water column or settle to the sea floor. Floating petroleum is particularly noxious because it reduces light penetration and the exchange of oxygen at the water's surface. Floating oil also contaminates the microlayer. The microlayer refers to the uppermost portion of the water column. It is home to thousands of species of plants, animals, and microbes. The abundance of life in the microlayer attracts predators: seabirds from above and fish from below. Pollution in the microlayer, thus, has the potential to poison much of the aquatic food web.

Also worth noting, a single pint of oil released onto the water can cover one acre of water surface area.

The Law

Because of the harm associated with petroleum, the discharge of oil is absolutely prohibited. The Federal Water Pollution Control Act prohibits the discharge of oil or oily waste into or upon the navigable waters of the United States or the waters of the contiguous zone if such discharge causes a film or sheen upon, or discoloration of, the surface of the water, or causes a sludge or emulsion beneath the surface of the water. Violators are subject to a penalty of \$5,000.

The United States Coast Guard must be notified anytime a spill produces a sheen on the water. Call the National Response Center at 1-800-424-8802. Report the location, source, size, color, substance, and time of the spill. Failure to report a spill may result in fines.

The Clean Water Act (33 CFR 153.305) also prohibits the use of soaps or other dispersing agents to dissipate oil on the water or in the bilge without the permission of the Coast Guard. Soaps, emulsifiers and dispersants cause the petroleum to sink in the water column and mix with sediments where they will remain for years. Also, the soaps themselves are pollutants. You may be fined up to \$25,000 per incident for the unauthorized use of soap or other dispersing agents on the water or in the bilge.

Fueling Practices

Gas or diesel may be spilled during the act of fueling: as backslash out the fuel intake or as overflow out the vent fitting. Spills of this sort harm aquatic life, waste money, and can result in stains on the hull and damage to the gel coat and striping. Follow these tips to avoid problems:

- Fill tanks to no more than 90 percent capacity--gas that is drawn from cool storage tanks will expand as it warms up onboard your vessel.
- To determine when the tank is 90 percent full, listen to the filler pipe, use a sounding stick (if possible), and be aware of your tank's volume.
- Rather than filling your tank upon your return to port, wait and fill it just before leaving on your next trip. This practice will reduce spills due to thermal expansion because the fuel will be used before it has a chance to warm up.
- Fill portable tanks ashore where spills are less likely to occur and easier to clean up.
- Use oil absorbent pads to catch all drips.
- Slow down at the beginning and end of fueling.

Bilge Maintenance and Oil Changes

Engine oil tends to accumulate in bilges. If no precautions are taken, the oil is pumped overboard along with the bilge water. Discharging oily water is illegal. To avoid fines and to protect water quality, follow these tips:

- Keep your engine well tuned to minimize the amount of oil that is released. Be sure there are no leaking seals, gaskets or hoses.
- If you change your own oil, purchase a non-spill pump to draw crankcase oils out through the dipstick tube and slip a plastic bag over used oil filters prior to their removal to capture any drips. Hot drain the filter by punching a hole in the dome end and draining for 24 hours. Recycle the collected oil. Recycle the metal canister if practical. If not, dispose in your regular trash.
- Place oil absorbent materials or a bioremediating bilge boom in the bilge.
- Place an oil absorbent pad under the engine.
- Replace oil absorbent materials regularly.
- Look for contractors or marinas that offer a bilge pumpout service.
- Do not treat oily water with detergents. Soaps pollute and make clean up impossible. You may be fined up to \$25,000 for using soaps to dissipate oil.

Disposal of Oil Absorbent Materials

The disposal of used oil absorbent material depends on what type of product it is and how it was used:

- Standard absorbents that are saturated with gasoline may be air dried and reused.
- Standard absorbents saturated with oil or diesel may be wrung out over oil recycling bins (if they are saturated with oil or diesel only!) and reused. Alternatively, they should be double bagged with one plastic bag sealed inside of another and tossed in your regular trash.

- Bioremediating bilge booms may be disposed in your regular trash as long as they are not dripping any liquid. Because the microbes need oxygen to function, do not seal them in plastic bags.

Emissions Control

Marine engines--especially 2-stroke outboard motors--produce the highest average level of hydrocarbon exhaust emissions after lawn and garden equipment. Hydrocarbon emissions contribute to ground level ozone, a known health risk. Follow these tips to help your engine operate as efficiently as possible:

- Use the gas to oil ratio recommended by the engine manufacturer. Too much oil can foul spark plugs and too little can lead to increased engine wear or even failure.
- Use premium two-cycle engine oil (TC-W3 or TC-W4). Premium oils improve engine performance and reduce pollution because they burn cleaner, contain more detergents, and prevent formation of carbon deposits.
- Use gasoline with the octane level recommended by the engine manufacturer.

Preventative Equipment

Products are available commercially which can help you prevent spills and reduce emissions:

- Install a fuel/air separator along your vent line. These devices allow air, but not fuel to escape through a vent opening.
- Attach a safety nozzle to portable gas cans used to fill outboard engines. These nozzles automatically stop the flow of fuel when the receiving tank is full.
- To prevent oily bilge water from being discharged, install a bilge pump switch that leaves an inch or two of water in the bilge. Alternatively, connect a bilge water filter to your vessel's bilge pump. Filters will remove oil, fuel and other petroleum hydrocarbons from the water.
- When it is time to buy a new engine, select a fuel efficient, low emission model.
- Attach a container to the external vent fitting to collect overflow. There are products on the market that may be attached to the hull with suction cups. A rubber seal on the container fits over the fuel vent allowing the overflow to enter the container. Fuel captured in this manner can be added to the next boat to fuel.

In Case of a Spill:

- Stop the flow.
- Contain the spill.
- Call the U.S. Coast Guard National Response Center at (800) 424-8802.

Man-Overboard Emergency Instructions.
MetLife Boat Safety Tips
<http://www.uscgboating.org/safety/metlife/help.htm>

Getting Help on the Water

On the water, a minor problem can rapidly develop into a situation beyond your control. For this reason, let someone know even when you are experiencing relatively minor difficulties, **before** your situation turns into an emergency.

The Coast Guard serves as Search and Rescue (SAR) coordinator for all maritime emergencies and is the appropriate point of contact whenever you are concerned for your safety. If you are in distress (distress is defined as a situation where you or your boat are threatened by grave or imminent danger requiring assistance), the Coast Guard will take immediate steps to help you. Normally, Coast Guard or Coast Guard Auxiliary rescue boats and/or aircraft will be sent, but assistance from any available source will be arranged to expedite your rescue.

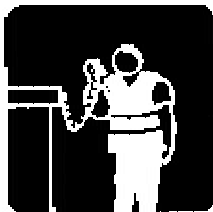
How To Signal For Help



If you are in distress use "MAYDAY, MAYDAY, MAYDAY" on the radio. If your situation is not a distress, simply call "Coast Guard." Channel 16 VHF/FM and 2182khz HF/SSB are dedicated distress and calling frequencies we monitor at all times. Citizen's Band (CB) is not dependable and is not monitored at most Coast Guard stations. If you do not have a radio, attempt to signal a fellow boater who can assist or call the Coast Guard for you. In a distress situation, use flares or any other distress signalling device to catch the attention of another boater.

What To Tell The Coast Guard

While arranging help, we will ask for the following:



- Your location or position.
- Exact nature of the problem (special problems).
- Number of people on board.
- Your boat's name, registration and description.
- Safety equipment on board.



When It's Not A Distress

The Coast Guard's primary search and rescue role is to assist boaters in distress. If you are not in distress and alternate sources of assistance are available, we will normally coordinate the effort to assist you. If you have a friend, marina, or commercial firm that you want contacted, we will attempt to do so. You may also contact them directly on Channel 16 VHF/FM or through the marine operator.

If this effort is unsuccessful, we will make a Marine Assistance Request Broadcast

(MARB) on your behalf. This announces that you need help, gives your location, and invites others to come to your aid.

If you do not accept services offered in response to the first MARB, we will:

- Provide information on other commercial firms, if available, so you may contact them directly, or
- If you request, make a second MARB to see if any other help is available.



Who Will Answer Your Call When You're Not In Distress

A commercial firm may offer help. In order to not interfere with commercial enterprise (you will have to pay for these services), we normally do not provide direct on-scene assistance if a commercial firm is available to help you safely in a reasonable time. If you agree to the assistance of a commercial firm and then refuse this service when it arrives, you still may be legally obligated to pay a fee.

If the Coast Guard or Coast Guard Auxiliary arrives to assist you and you require a tow, they normally will tow you to the nearest location where you can either arrange for repairs or a tow back to your home port.

In addition to Coast Guard, Coast Guard Auxiliary and commercial firms, others that may be available to assist you include a fellow boater, a local fire or police department, or another public agency. Keep in mind that a Good Samaritan, although well-meaning, may not have the equipment or skills needed to help you safely and effectively.



When To Call Back

Keep in contact with the Coast Guard at regular intervals. Call us when help arrives. If someone offers help but cannot get to you within a reasonable time, usually not to exceed one hour, contact the Coast Guard to arrange other assistance. We also need to know if conditions change sufficiently to cause alarm - for example:

- A medical emergency develops.
- A storm approaches.
- You begin to take on water.
- Your last reported position changes.

Tips On Non-Distress Assistance

Unless you are familiar with the person(s) offering you help, clearly understand the type and quality of the assistance offered before accepting help or entering into a contract. Consider the following before accepting any assistance: Large physical stresses can occur in towing and salvage operations, risking damage to one or both boats, and personal injury.

- Does the provider have the proper equipment to handle your problem safely?
- Does the provider have the proper insurance to protect you and your vessel if he/she should cause damage or injury.
- Can the crew handle the situation safely given the conditions and the nature of the problem?
- If a fee is being asked, does the operator have a Coast Guard license? All operators must have a license if they charge for towing services.

Remember The Signals!

Channel 16 VHF/FM * 2182 khz HF/SSB

Visual Distress Signalling Devices: (for example flares, signal mirror)

How To Avoid Trouble

For the safety of you and your passengers:

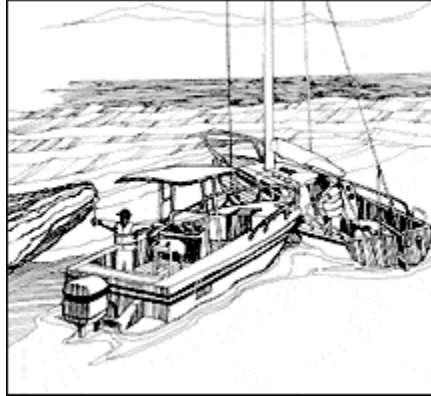
- Take a nationally recognized boating course.
 - Get a free Courtesy Marine Exam from the Coast Guard Auxiliary.
 - Fill your fuel tanks.
 - File a float plan.
 - Ensure your engine is properly tuned.
 - Check your engine compartment for fumes.
 - Instruct your passengers on basic safety procedures.
 - Always have everyone wear life jackets (PFDs).
 - Check your safety equipment.
- | | |
|-------------------------------|-----------------------------------|
| • Radio | • Flares and sound signal devices |
| • Life Jackets (PFDs) | • Compass and chart |
| • Fire extinguishers | • First aid kit |
| • Anchor and line | • Paddle and bailer |
| • Basic tools and spare parts | • Lights and flashlight |

Boating Accidents MetLife Boat Safety Tips

<http://www.uscgboating.org/safety/metlife/accidents.htm>

You Are Responsible

As the operator of a vessel you are required by law to file a formal, written report of an accident. There are four conditions that require you to fill out and send in a boating accident report.



A boating accident report must be filed when...

- A life is lost due to the accident.
- Someone is injured and requires medical attention beyond first aid.
- There is damage by or to the vessel and other property.
- Any person on board a vessel disappears (under circumstances indicating possible death or injury).

Boating Accidents Include:

Capsizing
Sinking/Flooding
Fire

Falls Overboard
Explosions

Collisions
Disappearance

* Damage is determined by federal regulation to be reportable when it exceeds \$500 or there is complete loss of the vessel (Note: many states have set a limit less than \$500 - contact the local boating authority to determine the amount).

- You just ran your beautiful boat into a submerged rock and put a hole in your hull. No one is hurt, but you estimate boat repairs will cost about \$800.
- Your boat took on water and flooded overnight. Repairs for the damage cost \$350.

Must you file an accident report in these scenarios? If you do, do you know how? Would you know where?

Reports Must Be Filed Within...

- 48 hours of the occurrence if a person dies within one day (24 hours of the accident).
- 48 hours if a person is injured and medical treatment beyond first aid is required.
- 10 days if there is only damage to the vessel and/or property.

All serious injuries and loss of life must be reported to local authorities immediately!

Who Must Fill Out The Form?

The form is usually filled out by the operator of the boat unless the operator is physically unable to complete the form. If that is the case, then the owner of the vessel must submit the form.

To obtain the forms and report the accident, call the State Boating Law Administrator where the vessel number was issued, or the state where the casualty or accident occurred if different.

If you need assistance in locating where to call within each state or territory, or reporting an accident, call the [Coast Guard Infoline](#).

Why Must A Report Be Filed?

The information you supply is used to develop safety regulations and manufacturing standards for the benefit of the boating public. The information is also used in boating safety education programs and other boating safety initiatives. Without good data, a boating safety hazard might be completely overlooked and other boaters could be hurt or killed.

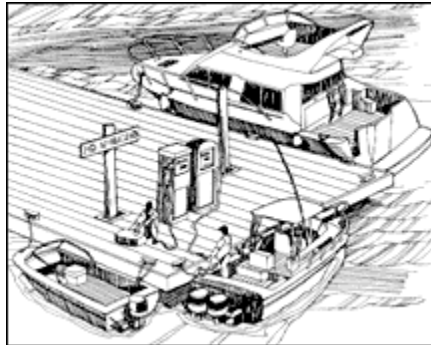
Fueling Safety MetLife Boat Safety Tips

<http://www.uscgboating.org/safety/metlife/distress.htm>

Shipshape is Firesafe

Fire safety is something that everyone who owns or operates a boat should practice. Each year, boating fires and explosions injure hundreds of individuals and cause millions of dollars in property damage. While there is a greater chance for a fire or explosion on a boat than on land, many of these accidents can be prevented.

Fuel and fuel vapors are two of the leading ingredients in all boating accidents involving fires and explosions. Keep fuel and vapors in their proper places and make all of your boating trips firesafe.



In General or Seasonal

Be alert for damage to your boat's fuel system. Over time, fuel fittings and fuel hoses wear out. Inspect these fittings and hoses regularly, especially near the engine where engine heat and vibration can accelerate deterioration.

- Inspect fuel tanks annually. Pay particular attention to bottom surfaces which may have been in contact with bilge water. Also check to see if any part of the tank could have rusted or been damaged due to rubbing and abrasion. Permanently installed fuel tanks and closed compartments that contain engine or fuel tanks must be vented to the outside.
- Be sure the fuel fill pipe is securely mounted, grounded, and located where spilled fuel would be directed overboard. Fuel fill hoses that are dry and cracked or soft and mushy should be replaced immediately.
- If a hose or fuel tank is leaking, replace it before using your boat.
- Use only marine-rated parts for repairs.
- On a boat with portable fuel tanks, make sure the vents can be closed and the tanks have a vapor-tight, leak-proof cap. The vent on a portable tank should be open when the motor is running, but when the tank is not in use, the vent and the cap should be tightly closed.
- Make sure any powered ventilation (a bilge blower) is operating properly.
- Be sure heating and cooking appliances on board are secured and operate properly. Refer to the appliance owner's manual for guidance on inspecting for leaks in valves and connections; NEVER USE A MATCH.

- Make sure flammable items are stowed safely and cannot come into contact with cooking or heating appliances or hot engine parts.
- Make sure fire extinguishers are Coast Guard approved and in working order - that gauges register and nozzles are clear.
- Take a boating safety course and learn the correct use of a fire extinguisher aboard a boat.
- Repair all bare wires and loose electrical connections; they might cause a short in your boat's electrical system, which could start a fire.
- Do not store disposable propane cylinders or charcoal lighting fluid on board.
- Conduct a bow to stern inspection checking for fuel leaks.

Before Casting Off

Get in the habit of performing these brief steps:



- "Sniff" your bilges. Usually your nose is the best fuel/vapor detector. It will mean getting down on your hands and knees, but it's the best way to do it.

- Operate the bilge blower for AT LEAST FOUR MINUTES before starting an inboard engine. If you still smell fumes, try to locate the source and make repairs before starting the engine.
- Make sure the location of your fire extinguishers is known to all passengers and they know how to operate them.
- When refueling, close all hatches, ports and other openings; shut off all engines and motors; and refrain from smoking. Fill all portable tanks on the dock.
- After refueling, wipe up or wash off any excess or spilled fuel; open all hatches and ports; and let the boat air out. "Sniff" your bilges. Operate the bilge blower for at least four minutes before starting an inboard engine.

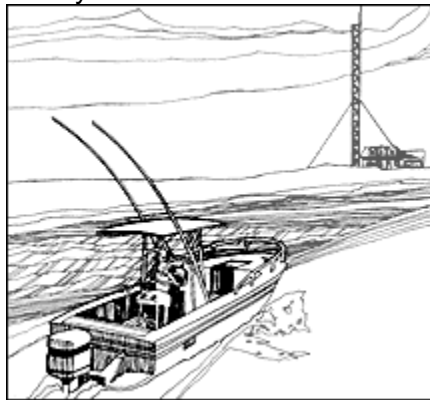
Use of Marine Radio
MetLife Boat Safety Tips
<http://www.uscgboating.org/safety/metlife/radio.htm>

Marine Radio Could be a Lifesaver

Why Should You Have A Marine Radio On Your Boat?

You are sailing to the farthest reaches of an isolated bay when you strike an uncharted, submerged object. You begin taking on water. No one is around. If you had a radio, you could call for help.

Motoring along the river, one of your passengers begins convulsions. You know you must contact medical authorities immediately, but you are without a radio. With a radio, medical help might be only a radio call away. Without one, it may be hours before you are able to get to a medical facility.



What Type Of Radio Should I Buy?

Investing in a good Very High Frequency FM (VHF FM) radio is the smartest purchase. A VHF radio has certain advantages such as:

- Good quality transmission.
- Strong signal.
- Channels reserved for distress calls.
- Continuously monitored frequencies.

Citizen Band (CB) radios are not recommended due to weak signals and overcrowded frequencies. In addition, the Coast Guard does not routinely monitor CB Channels.

Can I Use the Radio as a Telephone?

There is a marine operator in many areas, located on a specified channel, that will "patch" you into the local telephone system. A radio is not to be used for gossip or idle conversation. The use of profanity and obscene language is illegal. One difference between a telephone and a radio is that anything said over the radio will be heard by hundreds of other people. Another difference is that there are only a limited number of channels so conversation, should be kept to passing only required information. Conversation is not permitted to extend past three minutes.

What Are the Different Channels Used For?

There are 104 VHF channels designated for marine service. Of this number, 54 are designated exclusively for use in the waters of the United States. The most common channels and their purpose are listed below:

Channel 16 (156.8 MHz) This is the most important channel on the VHF band. THIS IS THE DISTRESS, SAFETY, AND CALLING FREQUENCY WHICH THE COAST GUARD MONITORS CONTINUOUSLY. All vessels equipped with VHF radios must keep their radios tuned to channel 16 so they can assist if an emergency is near. Vessels may initiate contact with each other but must shift to a working frequency to carry on a conversation (e.g., Motor vessel Albatross, this is sailing vessel Mother Goose, AB-1234, on Channel 16, switch and answer Channel 68). Use Channel 16 for only bona fide emergencies.

Channel 22A (157.1 MHz) This channel is the primary working channel of the Coast Guard. It is used for communications between the Coast Guard and the maritime public, both recreational and commercial. Severe weather warnings, hazards to navigation, and other maritime safety warnings are broadcast on Channel 22A.

Channel 13 (156.65 MHz) This channel is the bridge to bridge or "piloting" channel, used for communicating navigation information between ships. Strictly used for navigational purposes by commercial, military, and recreational vessels at locks, bridges and harbors.

Channel 6 (156.3 MHz) This channel is the ship to ship frequency used for safety related communications. This channel is not used for ordinary operational navigation or personal communications.



What Do Certain Words I Hear on the Radio Mean?

MAYDAY is a request for immediate assistance. LISTEN! DO NOT TRANSMIT!! Determine if you're in a position to help. If not, maintain radio silence. "MAYDAY" identifies an imminent, life-threatening emergency.

PAN-PAN (pronounced pahn-pahn) is used when the safety of a boat or person is in jeopardy. Man-overboard messages are sent with the PAN-PAN signal.

SECURITE (pronounced say-cure-e-tay) is used to pass navigation information or weather warnings.

What if I Hear Someone Saying MAYDAY on Channel 16?

If you have a radio and you are under way, you are required to monitor Channel 16. MAYDAY takes precedence over all other transmissions. If you hear a MAYDAY, remain silent and listen. Take down the information being passed. If the Coast Guard or other rescue authority responds, maintain silence and listen, but do not respond.

However, if there is no response, take action. Try raising the distressed vessel over the radio. Gather more information, especially the position. Attempt to raise the Coast Guard while traveling toward the vessel. Sometimes the Coast Guard may not hear the distressed vessels transmissions, but can hear another vessel near the scene; therefore,

call the Coast Guard again, just in case. If you raise them, give them the information you have and follow their instructions. If you cannot contact the Coast Guard, attempt to assist the other vessel to the best of your ability without placing yourself in danger.

What If I Need Help?

If you have an imminent life threatening emergency, transmit on Channel 16:

1. MAYDAY, MAYDAY, MAYDAY!
2. This is (name of boat three times, call letters once).
3. Repeat once more, "MAYDAY", (your boat's name).
4. Now report your position (give as accurate a position as possible).
5. Report nature of emergency.
6. Report the kind of assistance desired.
7. Report number of people on board and condition of any injured.
8. Description of the boat and seaworthiness.

Then wait for a response. If there is none, repeat the message.

Do I Need A Radio License or Operator's Permit?

You must have a SHIP STATION LICENSE for your radio before operation. An OPERATOR'S PERMIT is only required if you dock in a foreign port. To obtain forms and additional information contact the FCC at (202) 418-3676(FORM).

Transmission of a false (hoax) distress or emergency message or using obscene or profane language is illegal. If search and rescue units are sent out, the perpetrator is responsible for their costs in addition to the fine.

Visual Distress Signals for Recreational Boaters

MetLife Boat Safety Tips

<http://www.uscgboating.org/safety/metlife/distress.htm>

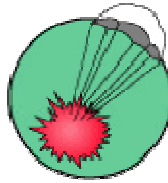
All vessels used on coastal waters, the Great Lakes, territorial seas, and those waters connected directly to them, up to a point where a body of water is less than two miles wide must be equipped with U.S.C.G. Approved visual distress signals. Vessels owned in the United States operating on the high seas must be equipped with U.S.C.G. Approved visual distress signals.

The following vessels are not required to carry day signals but must carry night signals when operating from sunset to sunrise:

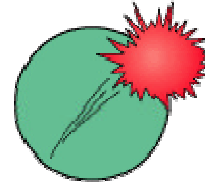
- Recreational boats less than 16 feet in length.
- Boats participating in organized events such as races, regattas, or marine parades.
- Open sailboats less than 26 feet in length not equipped with propulsion machinery.
- Manually propelled boats.



Red Flare
(hand held/day & night)



Parachute Flare
(day and night)



Red Meteor
(day and night)



Orange Smoke Signal
(hand held/day only)



Floating Orange Smoke Signal
(day only)

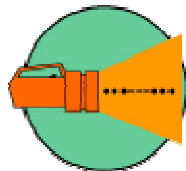
Pyrotechnic Devices

Pyrotechnic Visual Distress Signals must be Coast Guard Approved, in working condition, and readily accessible. They are marked with a date showing the service life, which must not have expired. Launchers manufactured before January 1, 1981 intended for use with approved signals are not required to be Coast Guard Approved. If pyrotechnic devices are selected, a minimum of three are required. That is, three signals for day use and three signals for night.

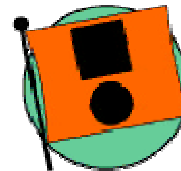
Some pyrotechnic signals meet both day and night use requirements. Pyrotechnic devices should be stored in a cool, dry location. A watertight container painted red or orange and prominently marked "DISTRESS SIGNALS" is recommended.

U.S.C.G. Approved Pyrotechnic Visual Distress Signals and Associated Devices include:

- Pyrotechnic red flares, hand-held or aerial.
- Pyrotechnic orange smoke, hand-held or floating.
- Launchers for aerial red meteors or parachute flares.



Electric Distress Signals
(night only)



Orange Flag
(day only)

Non-Pyrotechnic Devices

Non-Pyrotechnic Visual Distress Signals must be in serviceable condition, readily accessible, and certified by the manufacturer as complying with U.S.C.G. requirements. They include the Orange Distress Flag and the Electric Distress Light.

The distress flag is a day signal only. It must be at least 3 x 3 feet with a black square and ball on an orange background. It is most distinctive when attached and waved on a paddle, boathook or flown from a mast.

The electric distress light is accepted for night use only and must automatically flash the international SOS distress signal (... - - - ...).

Regulations prohibit display of visual distress signals on the water under any circumstances except when assistance is required to prevent immediate or potential danger to persons on board a vessel.

All distress signals have distinct advantages and disadvantages. No single device is ideal under all conditions or suitable for all purposes. Pyrotechnics are universally recognized as excellent distress signals. However, there is potential for injury and property damage if not properly handled. These devices produce a very hot flame and the residue can cause burns and ignite flammable material.

Hand-held pyrotechnic devices, such as flares and smoke signals, may expel ash and slag as they burn. Even though these particles cool quickly, they can cause painful burns or ignite materials that burn easily. The flare itself is very hot and can start a fire if it is dropped. Therefore, these devices when burning should be held over the side and in such a way that hot slag can not drip on the hand.

Pistol launched and hand-held parachute flares and meteors have many characteristics of a firearm and must be handled with caution. In some states they are considered a firearm and prohibited from use.

Whenever a pistol or hand-held rocket propelled distress signal is used, the wind must be taken into account. In calm winds keep your arm at approximately 60 degrees above the horizon with the wind at your back when firing the device. As the wind increases, increase the angle of the arm up to but no more than about 80 to 85 degrees. No pyrotechnic device should be fired straight up or in such a direction that it may land on your boat or another boat or on land and cause a fire.

The following illustrates the variety and combination of devices which can be carried in order to meet the requirements:

- Three hand-held red flares (day and night).
- One hand-held red flare and two parachute flares (day and night).
- One hand-held orange smoke signal, two floating orange smoke signals (day), and one electric distress light (night only).



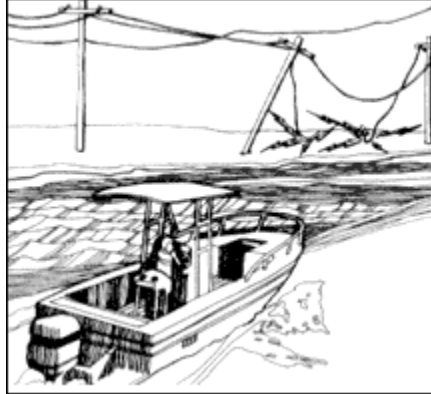
All boaters should be able to signal for help. For the CME, boaters must have current dated U.S.C.G. Approved day and night signals for all boats operating on coastal and open bodies of water. The Auxiliary also requires some method of emergency signals for inland water. This may be a signal flag for day and a flashlight for night.

Power Line Hazards

MetLife Boat Safety Tips

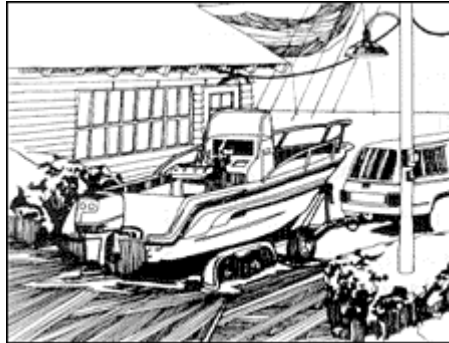
<http://www.uscgboating.org/safety/metlife/powerline.htm>

Lightning isn't the only source of lethal doses of electricity. Among the most tragic and preventable boating accidents are those in which a boat strikes a power line. Often, the boat doesn't necessarily have to touch a power line to send a current of electricity through it. Certain conditions (such as high humidity and close proximity) will cause an arcing to take place through the surrounding air and possibly into the boat.



At Launching

Power lines at launch ramps are especially hazardous to boaters. A tragedy occurred recently when a father and son were attempting to launch their small catamaran from a lakeside ramp. They were pushing the boat trailer by hand down the street from their cottage to the ramp incline, and failed to see the overhanging power lines. Prior to the boat ever reaching the water, both were electrocuted when the boat's mast touched one of the high voltage wires.



Look Up

Don't let a similar tragedy happen to you. LOOK UP to check for any overhead wires between your boat and the launching ramp before you even get near it. Make certain that you will not be raising the mast or antenna too near a power line. Exercise particular caution at older boat ramps, since they have greater likelihood of having exposed power lines strung near waterways.

Open Water

High tension transmission lines that cross reservoirs and other boating areas are also dangerous. If the tip of the mast or antenna should come close to one of these lines, the

electrical current may be strong enough to bridge the gap and flow to the boat.

The fact that you have gone under the lines previously does not guarantee that they are safe. The water level may rise from tides, flooding or controlled damming or the lines may expand and sag from the heat.

Boats have also been known to strike power lines simply because their operators didn't have up-to-date charts or didn't know how far it was from the boat's waterlines to the mastheads. Usually, power lines that span bodies of water have the minimum clearance between their lowest point and the highest waterline mark indicated on charts or signs at the approach to them. LEARN these clearance distances!

Observe!

Be observant for downed or sagging lines following storms or high winds. A watchful eye upward as well as in other directions is needed. Look to see if the area is marked with a special hazard buoy or sign. Most power companies take the responsibility to post warning signs wherever their lines span a body of water.



Don't Panic!

Should your boat come in contact with a power line, DO NOT jump into the water. The electrical charge will pass through your boat and be grounded in the surrounding water. The best thing to do is remain low in the boat and avoid touching any metal fixtures. Leave the boat only after any arcing has stopped.

Alert!

The Coast Guard wants to alert all boaters to the dangers of navigating near power lines and urges everyone to help prevent such accidents. All dealers, marinas, boatyards, yacht clubs and boating associations are urged to help reduce this hazard by alerting boaters who use their facilities.

First Aid for Electrical Burns (courtesy of The American Red Cross)

The signals of electrical injury include:

- Unconsciousness.
- Dazed, confused behavior.
- Obvious burns on the skin surface.
- Trouble breathing.

- Weak, irregular, or absent pulse.
- Burns both where the current entered and where it exited, often on the hand or foot.

Never approach a victim of an electrical injury until you are sure the power is off, or the power source has been removed from the injury site. **DO NOT TOUCH DOWNED POWER LINES.** Keep bystanders well away from any source of live current.

To care for a victim of an electrical injury, make sure the scene is safe. Alert the Coast Guard or Emergency Medical Services (EMS) immediately. Do a primary survey. Be aware that the victim may have trouble breathing or may be in cardiac arrest. Check for more than one burn site. Cover all burns with dry, sterile dressings and treat for shock.

Attachment 4

Malcolm Pirnie, Inc. Hazardous Communication

TABLE OF CONTENTS

	<u>PAGE</u>
1.0 INTRODUCTION	1
2.0 ORGANIZATION AND RESPONSIBILITIES	1
2.1 MANAGER, HEALTH AND SAFETY	2
2.2 OFFICE MANAGERS	2
2.3 HAZARD COMMUNICATION COORDINATORS	2
2.4 PROJECT MANAGERS	3
2.5 PROJECT SAFETY OFFICERS	3
2.6 PROJECT AND OFFICE STAFF	3
3.0 WRITTEN HAZARD COMMUNICATION PROGRAM.....	4
3.1 PROGRAM AVAILABILITY	4
4.0 COMPREHENSIVE LIST OF HAZARDOUS CHEMICALS.....	4
4.1 LIST DEVELOPMENT	4
5.0 MATERIAL SAFETY DATA SHEETS (MSDSS).....	5
5.1 ESTABLISHING AN MSDS STATION	5
5.2 USING A MSDS	5
5.3 SECTION 1 - GENERAL INFORMATION	6
5.4 SECTION 2 - HAZARDOUS COMPONENTS	6
5.5 SECTION 3 - PHYSICAL AND CHEMICAL DATA	6
5.6 SECTION 4 - FIRE AND EXPLOSION HAZARD DATA	7
5.7 SECTION 5 - REACTIVITY DATA	7
5.8 SECTION 6 - HEALTH HAZARD DATA	7
5.9 SECTION 7 - PRECAUTIONS FOR SAFE HANDLING, STORAGE AND USE	8
5.10 SECTION 8 - SPILL AND DISPOSAL PROCEDURES.....	8
5.11 SECTION 9 - HAZARDOUS MATERIAL IDENTIFICATION (LABEL DATA OR TRANSPORTATION)..	8
5.12 SECTION 10 - SPECIAL PRECAUTIONS AND COMMENTS	8
5.13 REMOVING MSDSS	8
5.14 UPDATING MSDSS	8
5.15 HELP OBTAINING MSDSS	9
5.16 CHEMICAL DATA SHEETS NO SUBSTITUTE FOR MSDSS	9
6.0 LABELS.....	9
6.1 LABEL REQUIREMENTS	9
6.2 HAZARDOUS MATERIALS IDENTIFICATION GUIDE (HMIG) LABELING SYSTEM.....	10
6.3 HAZARDOUS WASTE SAMPLE LABELING.....	10
6.4 TEMPORARY CONTAINERS MUST BE LABELED	10
6.5 LONGER-TERM CONTAINERS REQUIRE HMIG LABELS	10
7.0 MULTI-EMPLOYER/MULTI-LOCATION PROJECT SITES.....	11

7.1	INFORMING OTHER EMPLOYERS.....	11
7.2	OBTAINING INFORMATION FROM OTHER EMPLOYEES	11
7.3	MULTI-LOCATION PROJECT SITES	11
8.0	NON-ROUTINE TASKS	12
9.0	HAZARD COMMUNICATION TRAINING.....	12
9.1	HAZARD COMMUNICATION TRAINING PROGRAM FOR HAZARDOUS CHEMICALS MALCOLM PIRNIE INTRODUCES TO THE WORKPLACE, MINIMUM REQUIREMENTS	12
9.2	HAZARD COMMUNICATION TRAINING PROGRAM FOR HAZARDOUS CHEMICALS OTHER EMPLOYERS INTRODUCE TO THE WORK PLACE, MINIMUM REQUIREMENTS.....	13
9.3	HAZARD COMMUNICATION TRAINING PROGRAM REVIEW	13
10.0	RECORDS RETENTION.....	14

APPENDICES

APPENDIX A	OSHA HAZARD COMMUNICATION STANDARD 29 CFR 1910.1200
APPENDIX B	COMPREHENSIVE LIST OF HAZARDOUS CHEMICALS
APPENDIX C	HAZARD MATERIALS IDENTIFICATION GUIDE (HMIG) LABELING SYSTEM WITH EXAMPLES
APPENDIX D	APPROVED LETTER FORMATS, MULTI-EMPLOYER WORK SITE

1.0 INTRODUCTION

Malcolm Pirnie's Hazard Communication Program was developed to meet the requirements of the OSHA Hazard Communication Standard, Title 29 Code of Federal Regulations 1910.1200 et seq. A copy of this standard is provided in Appendix A.

OSHA requires that employers make information available to staff members about hazardous chemicals they may be exposed to in the workplace. This information includes, but is not limited to, toxicology, physical and chemical hazards, means of detection, and protection against exposure.

Malcolm Pirnie makes this information available to staff members through this written hazard communication program, lists of chemicals in use, current copies of Material Safety Data Sheets (MSDSs), container labeling, and staff training.

The OSHA Hazard Communication Standard recognizes that Malcolm Pirnie may be the only employer on some work sites, and one of several employers on others. This Hazard Communication Program has provisions for requesting and communicating information on hazardous chemicals others bring to the work site that Malcolm Pirnie staff may be exposed to during the course of their duties.

For this reason, Malcolm Pirnie maintains a copy of this program at all Malcolm Pirnie work sites, whether or not the firm is responsible for the presence of hazardous chemicals at the site. Some states or local municipalities may have specific Right-To-Know or Community Right-To-Know requirements not addressed in this Hazard Communication Program. Accordingly, Office Managers, Project Managers, or their designees should determine the specific requirements of the localities where they operate.

2.0 ORGANIZATION AND RESPONSIBILITIES

The Manager, Health and Safety, WHI, is responsible for Hazard Communication Program content.

Office Managers are responsible for seeing that the program is implemented in their offices. They may delegate the administration of the program to a staff member they designate as the Hazard Communication Coordinator. This individual is typically the local Health and Safety Coordinator/Contact.

Project Managers are responsible for Hazard Communication Program implementation on their projects.

2.1 Manager, Health and Safety

The Manager, Health and Safety, WHI, is responsible for:

- Preparing and updating the written program, the Hazard Communication labeling program, and Hazard Communication training materials.
- Maintaining corporate Hazard Communication training records.
- Serving as a technical resource on chemical safety for technical and administrative staff.
- The implementation and execution of the corporate aspects of this program.

2.2 Office Managers

The Office Managers are responsible for:

- Designating a staff member (typically the Health and Safety Coordinator/Contact) to serve as Hazard Communication Coordinator.
- Supporting the Hazard Communication Coordinator by providing:
 - A Material Safety Data Sheet (MSDS) station at a visible location in the office;
 - The overhead time required to maintain the MSDS station and labeling program; and,
 - Visible and continuous support for the Program.
 - Ensuring that all staff who may be exposed to hazardous chemicals or materials receives appropriate hazard communication training before they start a task or assignment.

2.3 Hazard Communication Coordinators

Hazard Communication Coordinators are responsible for:

- Maintaining a current copy of the written Hazard Communication Program, and the OSHA Hazard Communication Standard in the MSDS station.
- Developing and maintaining a comprehensive list of hazardous chemicals based upon the MSDSs.
- Maintaining current MSDSs for hazardous chemicals used by project and office staff.
- Gathering and filing MSDSs for hazardous chemicals contractors, vendors and cleaning services use at their location.
- Inspecting incoming shipments of hazardous chemicals from manufacturers, wholesalers, retailers, formulators, laboratories, and others, for proper labeling, after being notified of their arrival.
- Providing or arranging for training for office and project staff on the hazards of chemicals in the work place, for all potentially exposed employees.
- Providing records of Hazard Communication training received by each employee, including type of training, date and name of instructor to Health & Safety, COR.

2.4 Project Managers

Project Managers are responsible for:

- Designating a project safety officer knowledgeable in the requirements of this Program.
- Assuring that the project safety officers implement the elements of this Program as they pertain to each project.

2.5 Project Safety Officers

Project Safety Officers are responsible for:

- Bringing a copy of the following documents to the project site:
 - The written Hazard Communication Program;
 - The OSHA Hazard Communication Standard; and,
 - Current Material Safety Data Sheets for each hazardous chemical Malcolm Pirnie introduces to the site.
- Developing and maintaining a comprehensive list of hazardous chemicals Malcolm Pirnie introduces to the job site, and making it accessible to all staff on the site.
- Notifying the designated Hazard Communication Coordinator when shipments of hazardous chemicals arrive at the site and giving Materials Safety Data Sheets (MSDSs) which accompany incoming shipments to the Hazard Communication Coordinator for review and filing.
- Contacting the source of the hazardous chemicals if the MSDSs are not complete or if an MSDS is not supplied with an initial shipment.
- Ensuring that temporary and permanent hazardous chemical containers are labeled.
- At multi-employer sites, telling the other employers the location of the written Malcolm Pirnie Hazard Communication Program and copies of MSDSs for the site.
- Communicating with other employers e.g., Owner, Contractors, Subcontractors, to obtain information about the location of their written hazard communication program(s), labeling program, and Material Safety Data Sheets, and, if applicable, information on the hazardous chemicals they may produce or introduce to the job site that Malcolm Pirnie employees may be potentially exposed to.

2.6 Project and Office Staff

Project and office staffs are responsible for:

- Reading and understanding the provisions of this Program.
- Reviewing the MSDSs for each hazardous chemical used in the workplace prior to handling or contact.

- Using proper labels for temporary containers.
- Alerting the project safety officer or the office Hazard Communication Coordinator to the arrival of new or additional shipments of hazardous chemicals to the office or worksite.

3.0 WRITTEN HAZARD COMMUNICATION PROGRAM

3.1 Program Availability

Copies of the written Hazard Communication Program and the OSHA Hazard Communication Standard are maintained at an accessible MSDS station. MSDS stations are designated in each permanent or long-term company location, including permanent offices, field offices, and field trailers.

At temporary job sites, if Malcolm Pirnie is bringing hazardous chemicals to the work site or if, based on past experience, another employer is expected to bring hazardous chemicals to the work site, a copy of this written Hazard Communication Program and relevant MSDSs are maintained on-site for the duration of field activities.

If Malcolm Pirnie is the only employer on a site, and if no hazardous chemicals are being brought to the site, it is strongly suggested that a copy of this written program be maintained on-site during field activities. However this is not a requirement.

4.0 COMPREHENSIVE LIST OF HAZARDOUS CHEMICALS

4.1 List Development

Complete the Comprehensive List of Hazardous Chemicals form provided in Appendix B, list each product containing a hazardous chemical, as defined in Appendix A of this section, 29 CFR 1910.1200 (d). Use the trade or common name of the product, the manufacturer, the hazardous chemical ingredients it contains, and the location where it is used and/or stored. Use as many lines as necessary. This list is to be updated as required.

A copy of the Comprehensive List of Hazardous Chemicals shall be maintained at the MSDS Stations of company and field locations, together with the written Hazard Communication Program.

5.0 MATERIAL SAFETY DATA SHEETS (MSDSs)

Malcolm Pirnie asks that its suppliers provide MSDSs for any purchased materials that contain hazardous chemicals as defined by OSHA. This request is made through language on Malcolm Pirnie contracts or verbally by staff members ordering materials, at the time an order is placed or a purchase made. MSDSs are kept for every chemical used and are made available to employees at company locations and work sites.

5.1 Establishing An MSDS Station

Office Managers shall provide sufficient space and resources to establish an MSDS Station within their company or field locations. Office MSDS Stations should consist of a labeled three ring binder and a sign (Laboratory Safety Supply 1992 model No. JX-12441 or equivalent). In temporary locations, an MSDS Station may be a bulletin board or a three-ring binder kept on-site.

Each MSDS Station shall be located in an accessible, common area such as a break room, copier room, or site trailer. It shall also contain a copy of: the written Hazard Communication Program, the OSHA Hazard Communication Standard, and the Comprehensive List of Hazardous Chemicals.

Original Material Safety Data Sheets are preferred, but copies may be substituted. Copies are to be current (dated within three years) and published by the manufacturer, importer, or formulator of the hazardous chemical. For small projects, or projects of short duration, the contents of the MSDS Station, described above, may be included with the site-specific Health and Safety Plan or other project documents.

5.2 Using A MSDS

It is in the company's best interest to make sure that everyone who uses a chemical product understands its dangers and the precautions they must take while using the product. The sheets also contain useful information for responding to an exposure or release.

A Material Safety Data Sheet (MSDS) is supplied to the company when a substance is purchased that contains a hazardous chemical(s) as defined by OSHA (The Occupational Safety and Health Administration). The delivery of a substance must not be accepted until the MSDS sheet has been received.

There is no specific format for providing this information; however, MSDSs typically consist of the following general sections. The sections listed on your specific MSDSs may be different from those listed below. The bulleted information presents a list of typical information contained in each of the sections.

5.3 Section 1 - General Information

- Name of Manufacturer
- Manufacturer's Address
- Emergency Phone Number
- Trade named of Product(s) with applicable stock number(s)
- Product name
- Product formula
- CAS Registry No.

5.4 Section 2 - Hazardous Components

- Chemical components of the product are listed if they present a physical or health hazard and are present at or above 1% in the mixture.
- Chemical components identified as carcinogens by NTP, IARC, and OSHA are listed if they are present at or above 0.1% in the mixture.
- Other components are listed if deemed appropriate.
- Identities of components listed generically are declared trade secrets by the raw material suppliers.
- Exposure recommendations are for individual components. Unless specifically listed as an OSHA Permissible Exposure Limit (PEL) and/or an American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV), all exposure limits are those on which OSHA and ACGIH concur.

5.5 Section 3 - Physical and Chemical Data

- Appearance and Odor - Physical appearance, color and smell.
- Boiling Point - If unknown, the lowest value of the component is listed for mixtures.
- Vapor Pressure - If unknown, the lowest value of the component is listed for mixtures.
- Vapor Density - Compared to Air. Expressed as lighter as or heavier than air if the vapor density of the product is not known.
- Evaporation Rate - Indicated as faster than or slower than Ethyl Ether or Butyl Acetate.
- Melting Point
- Specific Gravity
- Decomposition Temperature
- Solubility in Water
- Corrosion Rate
- Flash Point

5.6 Section 4 - Fire and Explosion Hazard Data

- Flash Point - Method Identified
- Flammability Limits - The lowest value and highest value of the individual components are listed for mixtures.
- National Fire Protection Association (NFPA) Rating
- Extinguishing Media - National Fire Protection Association Criteria
- Special Fire Fighting Procedures - Minimum equipment to protect firefighters from toxic products of vaporization, combustion, or decomposition in fire situations.
- Unusual Fire & Explosion Hazard - Known or expected hazardous products resulting from heating, burning, or other reactions.
- Category - The classification required by Department of Transportation (DOT) for shipping by road.

5.7 Section 5 - Reactivity Data

- Stability - Presents conditions to avoid preventing hazardous or violent decomposition.
- Conditions to avoid - Lists conditions to avoid so that hazardous reactions are avoided.
- Hazardous Polymerization - Conditions to avoid preventing hazardous polymerization that could result in a large release of energy.
- Materials to avoid/Incompatibles
- Hazardous decomposition products

5.8 Section 6 - Health Hazard Data

- Threshold Limit Value/Time Weighted Average (TLV/TWA)
- Permissible Exposure Limit (PEL)
- Toxicity (LD₅₀ - Lethal Dose for 50% of the test population)
- Carcinogenicity
- Effects of Overexposure (Acute) - Potential local and systemic effects due to single or short-term overexposure to the eyes and skin, or through inhalation or ingestion.
- Signs and Symptoms of Exposure - Warning signs, which may indicate exposure to the skin or eyes, or through inhalation or ingestion.
- Target Organs
- Medical Conditions Generally Aggravated by Overexposure - Preexisting conditions that may contribute to the effects of overexposure to the eyes and skin, or through inhalation or ingestion.
- Primary Route(s) of Entry - Based on properties of the product and expected use.
- Emergency and First Aid Procedures - Procedures to be followed when dealing accidental overexposure.

5.9 Section 7 - Precautions for Safe Handling, Storage and Use
(Control and Protective Measures)

- Protective equipment, which may be needed to handle the product.
- Ventilation - Identifies forced mechanical ventilation that is required.
- Respiratory Protection
- Eye/Skin Protection

5.10 Section 8 - Spill and Disposal Procedures

- Lists reasonable precautions to take and methods of containment, cleanup and disposal.
- Resource Conservation and Recovery Act (RCRA) hazardous wastes and Comprehensive Environmental Response, Comprehension and Liability Act (CERCLA) hazardous substances are listed in this section.
- Landfill Ban Item - Identifies materials subject to RCRA Landfill ban.

5.11 Section 9 - Hazardous material Identification (Label Data or Transportation)

- Hazardous materials identification system rating, based on ratings of individual components
- Shipping Name
- Emergency Response Code
- Department of Transportation (DOT), International Maritime Organization (IMO), International Air Transport Association (IATA), American Fertilizers Institute (AFI) hazard class designations/information.
- Reportable Quantities

5.12 Section 10 - Special Precautions and Comments

- Presents relevant information not previously mentioned.

5.13 Removing MSDSs

If a product is no longer used or if its MSDS has become dated, the Hazard Communication Coordinator removes the corresponding MSDS from the station and places it in a permanent MSDS file labeled with the actual or approximate dates the chemical was used.

5.14 Updating MSDSs

MSDSs are to be updated whenever:

- New information on the hazards of chemicals present in the work place becomes available.
- Relevant occupational exposure standards change.
- The issue date of the MSDS is more than three years old.

5.15 Help Obtaining MSDSs

MSDSs must be readily accessible to Malcolm Pirnie staff plus staff of any other employer at the work place during regular work shifts. If, after repeated attempts, an MSDS cannot be obtained from the manufacturer or supplier, contact the Manager, Health and Safety, WHI, for assistance. A written request for help in obtaining the required MSDSs will be made to the Assistant Secretary of Labor for Occupational Safety and Health (OSHA) and the Director of the National Institute for Occupational Safety and Health (NIOSH).

5.16 Chemical Data Sheets No Substitute for MSDSs

Chemical hazard data retrieved from electronic data bases may be useful in assessing hazards posed by on-site chemical contamination. But these chemical "data sheets" may not be substituted for original, current MSDSs published by the manufacturer, importer, or formulator. Data sheets lack the correct name of the manufacturer and emergency phone number.

6.0 LABELS

All containers of hazardous chemicals received from manufacturers, importers, or distributors of hazardous chemicals, or others, shall be properly labeled.

6.1 Label Requirements

A proper label provides the following information:

- The identity of the hazardous chemical(s) in the container.
- The name and address of the chemical manufacturer, importer, formulator, or other responsible party.
- Appropriate hazard and target organ warnings.

Affixed labels on incoming containers will not be removed or defaced. When labels are or have become illegible, legible replacement labels will be affixed over the original label.

All containers must be legibly labeled in English. In the event that non-English speaking employees or employers are onsite, duplicate labels providing above required information presented in their language must be affixed to appropriate containers.

Each container of hazardous chemicals (hazardous waste and environmental samples

are exempt) shipped to or from Malcolm Pirnie shall be checked by the Hazard Communication Coordinator or the Project Safety Officer for proper container labeling as described above.

6.2 Hazardous Materials Identification Guide (HMIG) Labeling System

The HMIG labeling system identifies chemicals with standard hazard ratings from 0 - 4 for health, flammability and reactivity, plus alphabetical designations for required personal protective equipment. A complete explanation of the rating and PPE designations can be found at the end of this section in Appendix C.

Malcolm Pirnie staff shall apply labels to temporary or portable containers, using the Hazardous Materials Identification Guide (HMIG) labeling system described in Appendix C. Labels shall contain at least the information provided on Laboratory Safety Supply 1993 type QA-809 label or equivalent. Appendix C also has examples of pre-completed labels that may be copied and applied to commonly used chemicals.

6.3 Hazardous Waste Sample Labeling

OSHA exempts shipments of hazardous waste samples from hazard communication labeling requirements. However, Department of Transportation (DOT) labeling requirements (49 CFR 173 et. al.) may apply to DOT defined hazardous substances shipped in large quantities. Hazardous materials or compressed gases shipped by air or common carrier will have special packaging, marking, and labeling requirements. Only trained HazMat employees may offer Hazardous Materials or Dangerous Goods for shipment on behalf of Malcolm Pirnie. Contact the Health and Safety, WHI for more information.

6.4 Temporary Containers Must Be Labeled

When transferring chemicals from a labeled container to a portable container intended for immediate use, a label identifying the contents e.g., Acetone, must be applied. Project staff are responsible for properly emptying, cleaning, removing the label, and disposing of the portable container immediately after use.

6.5 Longer-term Containers Require HMIG Labels

When transferring chemicals from a labeled container to a portable container intended for longer than immediate use, or use by more than one employee, a completed HMIG label should be used.

7.0 MULTI-EMPLOYER/MULTI-LOCATION PROJECT SITES**7.1 Informing Other Employers**

Project Safety Officers shall provide other employers at the work place with appropriate hazard communication information about hazardous chemicals Malcolm Pirnie introduces to the work site that their staff could be exposed to. Other employers will be presented with a copy of the written Hazard Communication Program upon request.

This hazard communication information shall include:

- Requirements and location of Malcolm Pirnie's written Hazard Communication Program.
- Locations of MSDSs or MSDS station.
- Location of Comprehensive Hazardous Chemical List.

For hazardous chemicals Malcolm Pirnie introduces to a work site, any precautionary measures being taken to protect Malcolm Pirnie staff from harmful exposure under normal operating conditions, and foreseeable emergencies.

7.2 Obtaining Information from Other Employees

Project Managers will support the efforts of the Project Safety Officer to obtain appropriate hazard communication information about hazardous substances used by other employers that Malcolm Pirnie staff may be exposed to.

This information should include:

- The location of the other employer(s) written Hazard Communication Programs, their Comprehensive List(s) of Chemicals, MSDSs or MSDS Station, and an explanation of the labeling system the other employer(s) use.
- Precautionary measures Malcolm Pirnie staff should take to protect themselves from harmful exposure to these hazardous chemicals under normal operating conditions, and foreseeable emergencies.

Appendix D at the end of this section has sample letters appropriate for soliciting this information from owners and other contractors.

7.3 Multi-location Project Sites

In the event that Malcolm Pirnie employees must travel between different work sites, the written Hazard Communication Program may be kept at a primary job site. When no primary work site has been designated, the employee must bring the written Hazard Communication Program with them.

8.0 NON-ROUTINE TASKS

The Project Manager must consult with the Hazard Communication Coordinator or the Project Safety Officer when planning a non-routine task to ensure that employees are informed of the hazards associated with these tasks and that appropriate personal protective equipment is provided.

Before work begins, a meeting between the Project Safety Officer and the potentially exposed employee(s) will be held to discuss the hazards and appropriate personal protective equipment required to complete the task. Information will be presented in the language of non-English speaking employees as well.

9.0 HAZARD COMMUNICATION TRAINING

Malcolm Pirnie employees complete initial Hazard Communication Training at the beginning of their employment and before starting tasks or assignments that may expose them to hazardous chemicals.

Project staff who work with or are potentially exposed to hazardous chemicals in the work place will receive additional training by the Project Safety Officer on their safe use. Office Managers and Project Managers shall provide resources sufficient to assure the availability of this training.

Hazard Communication Coordinators are responsible for conducting Hazard Communication Training or arranging for it to be provided. Both the training and associated materials may be developed locally to supplement materials provided by the Manager, Health and Safety, WHI.

9.1 Hazard Communication Training Program for Hazardous Chemicals Malcolm Pirnie introduces to the Workplace, Minimum Requirements

The Hazard Communication Training program for hazardous chemicals Malcolm Pirnie introduces to the work place emphasizes the following:

- Summary of the Hazard Communication Standard (see Appendix A, this section).
- Requirements and location of Malcolm Pirnie's written Hazard Communication Program.
- Development and location of hazardous chemical list.

- Use, locations, reading and interpreting MSDSs and how employees can obtain more hazard communication information.
- Reading, interpreting, and preparing HMIG container labels.
- Measures employees can take to protect themselves against the physical and health hazards of chemicals in the work place, including appropriate work practices or methods for using and handling chemicals, emergency response procedures, and, as required, the proper use and maintenance of personal protective equipment.
- Chemical and physical properties of hazardous chemicals e.g., flash point, and reactivity. Also, ways to detect the presence or release of hazardous chemicals in the work place, e.g., the visual appearance or odor of hazardous chemicals released. Also, air sampling devices to determine exposure concentrations.
- Health hazards, including signs and symptoms of exposure, associated with exposure to chemicals, and medical conditions aggravated by chemical exposure.

9.2 Hazard Communication Training Program for Hazardous Chemicals Other Employers introduce to the Work Place, Minimum Requirements

The Hazard Communication Training program for hazardous chemicals other employers introduce to the work place emphasizes the following:

- Information about hazardous chemicals Malcolm Pirnie staff may be exposed to at the work site, including ways to detect their presence, and exposure to them.
- An explanation of the other employers' labeling system.
- Information about precautionary measures Malcolm Pirnie staff members can take to protect themselves during normal operating conditions and in emergencies.
- The location of MSDSs for hazardous chemicals other employers introduce to a work site.

9.3 Hazard Communication Training Program Review

The Manager, Health and Safety, WHI, or designate shall review Malcolm Pirnie's Hazard Communication Training program and advise Office Managers on training or retraining needs.

Employees who may be exposed to hazardous chemicals are to be retrained whenever the chemical hazards change, and when Malcolm Pirnie introduces a new chemical hazard to the work place.

The Hazard Communication Training program assessment process includes periodically obtaining opinions from employees about the quality of the training they receive.

10.0 RECORDS RETENTION

Project Managers are also responsible for health and safety data storage after their projects are complete. Specific changes to the Hazard Communication Program developed for the project, correspondence, and copies of the MSDSs and other pertinent data on hazardous chemicals Malcolm Pirnie or others introduced to the job site are to be retained and stored together with the other project documents. Copies of occupational exposure data are to be filed in the employee's Health and Safety File with a copy forwarded to the Administrator, Health and Safety, WHI, for evaluation and retention.

APPENDIX A

**THE OSHA HAZARD COMMUNICATION STANDARD
29 CFR 1910.1200**

APPENDIX B

COMPREHENSIVE LIST OF HAZARDOUS CHEMICALS

HAZARD COMMUNICATION

COMPREHENSIVE LIST OF HAZARDOUS CHEMICALS**LOCATION:** Various Malcolm Pirnie Locations**PAGE 1 OF 1****COMPLETED BY:** Camille Carollo**DATE:** 2/1/05

TRADE OR COMMON NAME	MANUFACTURER'S NAME AND ADDRESS	HAZARDOUS INGREDIENTS	STORAGE OR LOCATION OF USE
Alconox	Varies	Alconox	Various Locations
Gasoline	Varies	Gasoline	Various Locations
Hexane	Varies	Hexane	Various Locations
Hydrochloric Acid	Varies	Hydrochloric Acid	Various Locations
Isobutylene	Varies	Isobutylene	Various Locations
Nitric Acid	Varies	Isobutylene	Various Locations
Sodium Hydroxide	Varies	Sodium Hydroxide	Various Locations
Sulfuric Acid	Varies	Sulfuric Acid	Various Locations

APPENDIX C
HAZARD MATERIALS IDENTIFICATION GUIDE (HMIG)
LABELING SYSTEM WITH EXAMPLES

**HAZARDOUS MATERIALS IDENTIFICATION GUIDE (HMIG)
LABELING SYSTEM¹**

This hazardous chemical labeling system uses the familiar colors and numbering system of the National Fire Prevention Association (NFPA) hazard diamond modified to quickly rate ACUTE² occupational and general physical hazards chemicals can pose. The potential health effects, flammability, and reactivity of a hazardous chemical are coded using a 0 - 4 numerical code system in blue, red and yellow boxes on the label. The numerical codes and corresponding general definitions are:

4	Extreme
3	Serious
2	Moderate
1	Slight
0	Nominal

The original MSDS for the chemical or mixture should be consulted to determine what degree (number) should be applied to the label. The toxicological information presented on the MSDS and in other chemical references can be compared to the ranges for LD₅₀; LC₅₀; and LD₅₀ Skin listed in each degree. References such as the Merck Index, the Chemical Dictionary, the NIOSH Pocket Guide, the DOT Emergency Response Guidebook, and others can be used if the MSDS is incomplete. Approximate health factors (some interpretation by the Hazard Communication Coordinator is necessary with any of these systems) may be found in the NFPA hazard diamond ratings (see NFPA 49,) the NIOSH Pocket Guide, Irving Sax Toxicological Properties of Chemical Substances, and others. Wallet cards that provide a ready reference to the HMIG Labeling System are available from the Administrator, Health and Safety, WHI.

¹ Copyright product of Lab Safety Supply

¹ Hazards such as carcinogenicity, mutagenicity and teratogenicity are not adequately addressed by these numerical hazard systems.

HEALTH HAZARD/BLUE BOX

4 - Extreme: materials that could cause death or major residual injury after very short exposure, even with prompt medical treatment. Materials considered too dangerous to approach without specialized equipment, and that can penetrate most protective clothing. Materials that, under normal or emergency conditions, are extremely hazardous when inhaled, or absorbed through the skin, or through other contact. LD₅₀ <0.001 g/kg; LC₅₀ <10 ppm; LD₅₀ Skin <0.005 g/kg

3 - Serious: materials that could cause serious temporary or residual injury after very short exposure even with prompt medical treatment. Materials requiring protection from all bodily contact. Materials giving off highly toxic combustion products. Materials corrosive to living tissue or toxic by skin absorption. LD₅₀ 0.001-0.05 g/kg; LC₅₀ 10-1100 ppm; LD₅₀ Skin 0.005-0.043 g/kg

2 - Moderate: materials that could cause temporary incapacitation or possible residual injury after intense or continued exposure without prompt medical treatment. Materials requiring the use of respiratory protection with independent air supply. Materials that give off toxic vapors lacking warning properties under normal or emergency conditions. LD₅₀ 0.05-0.5 g/kg; LC₅₀ 100-1,000 ppm; LD₅₀ Skin 0.044-0.340 g/kg

1 - Slight: materials that would cause irritation upon exposure, but minor residual injury even without medical treatment. Materials that require the use of an approved, air-purifying respirator. Materials that could cause skin irritation without tissue destruction. LD₅₀ 0.5-5.0 g/kg; LC₅₀ 1,000-10,000 ppm; LD₅₀ Skin 0.35-2.81 g/kg

0 - Minimal: materials that pose no hazard under normal occupational conditions. LD₅₀ 5.0-15.0 g/kg; LC₅₀ 10,000-100,000 ppm; LD₅₀ Skin 2.82-22.6 g/kg

FLAMMABILITY/RED BOX

4 - Extreme: materials that rapidly and completely vaporize at atmospheric pressure and normal ambient temperature, or that are readily dispersed in air, and burn readily. Includes cryogenic materials, Class 1A flammable liquids. Materials that, because of their physical form or environmental conditions, form explosive mixtures with air and disperse readily in air, e.g., dusts of combustible solids and mists of flammable or combustible liquid droplets.

3 - Serious: liquids and solids that can ignite under all ambient temperature conditions. Materials in this degree produce hazardous atmospheres with air under almost all ambient temperatures, or are readily ignited under almost all conditions though they are unaffected by ambient temperatures. Includes Class 1B and 1C flammable liquids. Solid materials in the form of course dusts that may burn rapidly but generally do not form explosive atmospheres in air. Materials that burn with extreme rapidity, usually by reason of self-contained oxygen. Materials that ignite spontaneously when exposed to air.

2 - Moderate: materials that must be moderately heated, or exposed to relatively high ambient temperatures before they ignite. Under normal conditions, materials in this degree would not form hazardous atmospheres in air, but under high ambient temperatures or under moderate heating, they may release vapor sufficient to produce hazardous atmospheres with air. Includes liquids with a flash point between 100°F and 200°F, and solids and semisolids that readily give off flammable vapors.

1 - Slight: materials that must be preheated before they ignite. Materials in this degree require considerable preheating, under all ambient temperature conditions, for ignition and combustion to take place. Includes materials that will burn in air when exposed to a temperature of 1500°F for five minutes or less; liquids, solids and semisolids with a flashpoint in excess of 200°F; most combustible materials.

0 - Minimal: materials that will not burn. Includes materials that will not burn in air when exposed to a temperature of 1500°F for five minutes.

REACTIVITY/YELLOW BOX

4 - Extreme: materials fully capable of detonation, explosive decomposition, or explosive reaction at normal temperatures and pressures. Materials sensitive to mechanical or localized thermal shock at normal temperatures and pressures.

3 - Serious: materials capable of detonation or explosive reaction, that require a strong initiating source or that must be heated under confinement before initiation. Includes materials sensitive to mechanical or localized thermal shock at elevated temperatures and pressures, or that react explosively with water or other chemicals with no heat or confinement requirement.

2 - Moderate: materials that are normally unstable and readily undergo violent chemical change, but do not detonate. Includes materials that undergo chemical change with rapid release of energy at normal temperatures and pressures, or undergo violent chemical change at elevated temperatures and pressures. Also, materials that may react violently with water or other chemicals, or may form potentially explosive mixtures with water or other chemicals.

1 - Slight: materials that are normally stable, but become unstable at elevated temperatures and pressures or that react with water and other chemicals with some release of energy, but not violently.

0 - Minimal: materials that are normally stable, and not reactive with water or other chemicals.

PPE

The HMIG system uses a series of codes and icons to describe various personal protective equipment ensembles. The original MSDS for the chemical or mixture should be consulted to determine what code to apply to the label.

A - Safety Glasses

B - Safety Glasses, Gloves

C - Safety Glasses, Gloves, Overgarment

D - Face Shield, Gloves, Overgarment

E - Safety Glasses, Gloves, Dust Mask

F - Safety Glasses, Gloves, Overgarment, Dust Mask

G - Safety Glasses, Gloves, Organic Vapor Respirator

H - Safety Goggles, Gloves, Overgarment, Organic Vapor Respirator

I - Safety Glasses, Gloves, Dust, Mist, Fume Respirator

J - Safety Goggles, Gloves, Overgarment, Dust, Mist, Fume Respirator

K - Air Supplied Respirator, Gloves, Overgarment with Hood, Protective Overboots

X - Special Ensemble, refer to Health and Safety Plan

HEXANE

ROUTE OF ENTRY <input checked="" type="checkbox"/> Eye Contact <input type="checkbox"/> Skin Absorption <input checked="" type="checkbox"/> Inhalation <input checked="" type="checkbox"/> Skin Contact <input type="checkbox"/> Injection		HEALTH 2																									
CHRONIC HEALTH EFFECTS <input type="checkbox"/> No Chronic Health Hazard <input type="checkbox"/> Carcinogen <input type="checkbox"/> Reproductive Toxin <input type="checkbox"/> Dermatitis <input type="checkbox"/> Sensitizer <input checked="" type="checkbox"/> Irritant <input type="checkbox"/> Teratogen <input type="checkbox"/> Mutagen <input type="checkbox"/> Corrosive		FLAMMABILITY 3																									
PHYSICAL HAZARDS <input type="checkbox"/> No Physical Hazards <input type="checkbox"/> Combustible <input type="checkbox"/> Pressure Hazard <input type="checkbox"/> Explosive <input type="checkbox"/> Pyrophoric Liquid <input checked="" type="checkbox"/> Flammable <input type="checkbox"/> Radioactive <input type="checkbox"/> Organic Peroxide <input type="checkbox"/> Water Reactive <input type="checkbox"/> Oxidizer		REACTIVITY 0																									
TARGET ORGANS <input type="checkbox"/> Bladder <input checked="" type="checkbox"/> Lungs <input type="checkbox"/> Blood <input type="checkbox"/> Mucous Membranes <input type="checkbox"/> Bone Marrow <input type="checkbox"/> Musculo-Skeletal System <input type="checkbox"/> Brain <input checked="" type="checkbox"/> Nervous System <input type="checkbox"/> Cardiovascular System <input type="checkbox"/> Reproductive System <input checked="" type="checkbox"/> Eyes <input checked="" type="checkbox"/> Respiratory System <input type="checkbox"/> Gastrointestinal System <input checked="" type="checkbox"/> Skin <input type="checkbox"/> Heart <input type="checkbox"/> Teeth <input type="checkbox"/> Kidneys <input type="checkbox"/> Liver		PROTECTIVE EQUIPMENT H																									
		<table border="1"> <tr> <td>A</td> <td></td> <td>G</td> <td></td> </tr> <tr> <td>B</td> <td></td> <td>H</td> <td></td> </tr> <tr> <td>C</td> <td></td> <td>I</td> <td></td> </tr> <tr> <td>D</td> <td></td> <td>J</td> <td></td> </tr> <tr> <td>E</td> <td></td> <td>K</td> <td></td> </tr> <tr> <td>F</td> <td></td> <td>X</td> <td>Ask your supervisor for special handling instructions.</td> </tr> </table>		A		G		B		H		C		I		D		J		E		K		F		X	Ask your supervisor for special handling instructions.
A		G																									
B		H																									
C		I																									
D		J																									
E		K																									
F		X	Ask your supervisor for special handling instructions.																								
SAFETY GLASSES GLOVES PROTECTIVE APRON BOOTS		RESPIRATOR GOGGLES FULL FACE RESPIRATOR HOOD FULL BODY SUIT BOOTS																									

ASCORBIC ACID

ROUTE OF ENTRY <input checked="" type="checkbox"/> Eye Contact <input type="checkbox"/> Skin Absorption <input type="checkbox"/> Inhalation <input checked="" type="checkbox"/> Skin Contact <input type="checkbox"/> Injection	HEALTH	1		
CHRONIC HEALTH EFFECTS <input type="checkbox"/> No Chronic Health Hazard <input type="checkbox"/> Carcinogen <input type="checkbox"/> Reproductive Toxin <input type="checkbox"/> Dermatitic <input type="checkbox"/> Sensitizer <input type="checkbox"/> Irritant <input type="checkbox"/> Teratogen <input type="checkbox"/> Mutagen <input checked="" type="checkbox"/> Corrosive	FLAMMABILITY	0		
PHYSICAL HAZARDS <input checked="" type="checkbox"/> No Physical Hazards <input type="checkbox"/> Combustible <input type="checkbox"/> Pressure Hazard <input type="checkbox"/> Explosive <input type="checkbox"/> Pyrophoric Liquid <input type="checkbox"/> Flammable <input type="checkbox"/> Radioactive <input type="checkbox"/> Organic Peroxide <input type="checkbox"/> Water Reactive <input type="checkbox"/> Oxidizer	REACTIVITY	1		
TARGET ORGANS <input type="checkbox"/> Bladder <input type="checkbox"/> Lungs <input type="checkbox"/> Blood <input type="checkbox"/> Mucous Membranes <input type="checkbox"/> Bone Marrow <input type="checkbox"/> Musculo-Skeletal System <input type="checkbox"/> Brain <input type="checkbox"/> Nervous System <input type="checkbox"/> Cardiovascular System <input type="checkbox"/> Reproductive System <input checked="" type="checkbox"/> Eyes <input type="checkbox"/> Respiratory System <input type="checkbox"/> Gastrointestinal System <input checked="" type="checkbox"/> Skin <input type="checkbox"/> Heart <input type="checkbox"/> Teeth <input type="checkbox"/> Kidneys <input type="checkbox"/> Liver	PROTECTIVE EQUIPMENT			
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;"> A  B  C  D  E  F  </td> <td style="width: 50%; text-align: center;"> G  H  I  J  K  X <small>Additional protection for specific handling requirements</small> </td> </tr> </table>		A  B  C  D  E  F 	G  H  I  J  K  X <small>Additional protection for specific handling requirements</small>
A  B  C  D  E  F 	G  H  I  J  K  X <small>Additional protection for specific handling requirements</small>			












APPENDIX D**APPROVED LETTER FORMATS, MULTI-EMPLOYER WORK SITES**

- Malcolm Pirnie Introduces Hazardous Chemicals to a Work Site
- Request for Location of Other Employer's MSDSs
- Follow-up Request for Location of Other Employer's MSDSs, no Response Received
- Follow-up Request for Location of Other Employer's MSDSs, no Response Received, Subcontractor involved

MALCOLM PIRNIE INTRODUCES HAZARDOUS CHEMICALS TO A WORK SITE

Date:

(Name and Address of Owner¹)

Re: OSHA Hazard Communication Standard

Dear *(name of owner)*:

The OSHA Hazard Communication Standard requires that each employer on a multi-employer work-site provide the other employers on the site with information about any hazardous chemical that may be produced or introduced onto the site.

As you are aware, employees of our company will be working at the *(name of site)* site. During the course of their work, our employees may be in proximity to hazardous chemicals that you may produce or introduce onto the site. Additionally, during the course of their work, your employees may be in proximity to hazardous chemicals that we may introduce to the site.

We are enclosing herewith information on the hazardous chemicals our company will introduce onto the site. *(See attached Appendix A)*.

We request the following information regarding your site, as required by the OSHA Hazard Communication Standard. Please advise us as to: where your Material Safety Data Sheets (MSDSs) are kept, any information regarding precautionary measures needed to protect our employees from exposure to hazardous chemicals under normal operating conditions and in any foreseeable emergency situations, and your labeling system for any hazardous chemicals at the site. Please respond in writing and direct all correspondence to the address below.

Thank you for your response to this request. If you have any questions, please contact *(insert your name)* at *(telephone number)*.

Very truly yours,

MALCOLM PIRNIE, INC.

(Your Name)

(Your Title)

Enclosure²

(Project Number)

Note:

¹ On projects involving the rehabilitation of a water or wastewater treatment plant, Owner will have treatment chemicals and probably will start introducing treatment chemicals and other hazardous chemicals to the project site as the project approaches Substantial Completion.

² Attach Exhibit A from site Hazard Communication Program

REQUEST FOR LOCATION OF OTHER EMPLOYER'S MSDS's

Date:

(Name and Address of Other Employer)

Re: OSHA Hazard Communication Standard
Title 29 CFR 1910.1200

Dear *(name of employer)*:

Employees of our company will be working on the (name of site) site at the same time as your company. During the course of their work, our employees may be in proximity to hazardous chemicals your company may produce or introduce onto the site. In order to comply with the OSHA Hazard Communication Standard, all employers who could cause hazardous exposure to another company's employees are required to provide information about the hazardous chemicals on site.

We are enclosing herewith information on the hazardous chemicals our company will introduce onto the site. *(See attached Appendix A)*.

Please advise us as to: where your Material Safety Data Sheets (MSDSs) are kept, any information you may have regarding precautionary measures needed to protect our employees under normal operating conditions and in any foreseeable emergency situations, and your labeling system used on site. Please respond in writing and direct all correspondence to the address below.

Thank you for your response to this request. If you have any questions, please contact *(insert your name)* at *(telephone number)*.

Very truly yours,

MALCOLM PIRNIE, INC.

(Your Name)
(Your Title)

Note: ¹ Attach Exhibit A from site Hazard Communication Program.

²When letter is sent to a Subcontractor, send a copy to the appropriate C

Enclosure¹

c: ²

(Project Number)

**FOLLOW-UP REQUEST FOR LOCATION OF OTHER EMPLOYER'S MSDSS, NO
RESPONSE RECEIVED**

Date:

(Name and Address of Owner)

Re: OSHA Hazard Communication Standard
Title 29 CFR 1910.1200

Dear *(name of owner)*:

By letter dated (date), we requested that you advise us as to where MSDSs are kept for all hazardous chemicals that you produce or introduce onto the (name of site) site. We also requested information regarding any precautionary measures to protect our employees during normal operations and in foreseeable emergencies, and your labeling system used on the site. To date, we have received no response.

In order for you and Malcolm Pirnie, Inc. to be in compliance with the OSHA Hazard Communication Standard, we must receive the requested information.

Your cooperation and prompt attention to this matter is appreciated.

Very truly yours,

MALCOLM PIRNIE, INC.

(Your Name)

(Your Title)

(Project Number)

**FOLLOW-UP REQUEST FOR LOCATION OF OTHER EMPLOYER'S MSDSS, NO
RESPONSE RECEIVED, SUBCONTRACTOR INVOLVED**

Date:

(Name and Address of Other Employer)

Re: OSHA Hazard Communication Standard
Title 29 CFR 1910.1200

Dear *(name of employer)*:

By letter dated *(date)*, we requested that you advise us as to where MSDSs are kept for all hazardous chemicals that you produce or introduce onto the *(name of site)* site. We also requested information regarding any precautionary measures to protect our employees during normal operations and in foreseeable emergencies and your labeling system used on the site. To date, we have received no response.

In order for you and Malcolm Pirnie, Inc. to be in compliance with the OSHA Hazard Communication Standard, we must receive the requested information.

Your cooperation and prompt attention to this matter is appreciated.

Very truly yours,

MALCOLM PIRNIE, INC.

(Your Name)

(Your Title)

c:¹

(Project Number)

Note: ¹When letter is sent to a Subcontractor, send a copy to the appropriate Contractor.

Attachment 5

Malcolm Pirnie, Inc. Hazardous Waste Emergency Response

TABLE OF CONTENTS

	<u>PAGE</u>
1.0 INTRODUCTION.....	3
2.0 REFERENCES.....	3
3.0 APPLICATION.....	3
4.0 SAFETY AND HEALTH RISK ANALYSIS	4
4.1. PROJECT TASKS.....	4
4.2. SAFETY AND HAZARD ANALYSIS.....	4
4.3. GENERAL PHYSICAL/BIOLOGICAL HAZARDS	4
4.3.1. Heat Stress	4
4.3.2. Noise.....	6
4.3.3. Slip, Trip and Fall Hazards	6
4.3.4. Equipment Operation	6
4.3.5. Utility Avoidance (overhead and underground)	6
4.3.6. Electrical	7
4.3.7. Vehicular Traffic	7
4.3.8. Falling Objects.....	7
4.4. BIOLOGICAL HAZARDS	7
5.0 SOCIAL CONDITIONS.....	9
6.0 HEALTH AND SAFETY ORIENTATION TRAINING	9
7.0 SPECIALIZED TRAINING	10
7.1. PRE-INVESTIGATION HEALTH AND SAFETY BRIEFING	10
7.2. SITE/RADIATION ORIENTATION PROGRAM	11
7.3. HEALTH AND SAFETY FIELD AUDIT.....	11
7.4. MORNING SAFETY MEETINGS.....	11
8.0 HAZARD COMMUNICATION.....	12
9.0 MEDICAL SURVEILLANCE AND EXPOSURE MONITORING	13
9.1. MEDICAL SURVEILLANCE	13
10.0 PERSONAL PROTECTIVE EQUIPMENT	14
10.1. GENERAL PROTECTION LEVELS.....	14
10.2. INSPECTION OF PPE	17
11.0 EXPOSURE MONITORING	17
11.1. GENERAL	17
11.1.1. Minirae Photoionization Detector	18
11.1.2. Oxygen Combustible Gas Indicator (CGI).....	18
11.1.3. Personal dataRAM.....	18
11.1.4. Gamma Radiation Scintillation Detector	19
11.1.5. Drager Pumps and Tubes	19
11.1.6. Jerome Mercury and Hydrogen Sulfide Detectors	19
11.2. PERSONAL MONITORING.....	19
12.0 ACTION LEVELS FOR WORK AREA MONITORING	19
12.1. EXPOSURE MONITORING/AIR SAMPLING PROGRAM.....	20
13.0 SITE CONTROL MEASURES	20
13.1. ENGINEERING CONTROLS	20

13.2.	SITE ACCESS	21
13.3.	ESTABLISHMENT OF WORK ZONES	21
13.4.	EXCLUSION ZONE	21
13.5.	CONTAMINANT REDUCTION ZONES.....	22
13.6.	SUPPORT ZONE	22
14.0	DECONTAMINATION PROCEDURES	22
14.1.	PERSONNEL DECONTAMINATION PROCEDURES.....	22
14.2.	PERSONNEL DECONTAMINATION EQUIPMENT.....	23
14.3.	EQUIPMENT DECONTAMINATION	24
15.0	COLLECTION, STORAGE AND DISPOSAL PROCEDURES	24
16.0	HAZARDOUS WASTE EMERGENCY RESPONSE.....	24
16.1.	KEY PERSONNEL.....	25
16.1.1.	<i>First Responder Awareness Level</i>	25
16.1.2.	<i>First Responder Operations Level</i>	25
16.1.3.	<i>Hazardous Materials Technician</i>	26
16.1.4.	<i>Hazardous Materials Specialist</i>	26
16.1.5.	<i>On Scene Incident Commander</i>	27
16.2.	EMERGENCY RESPONSE ORGANIZATION	27
16.3.	EMERGENCY RESPONSE PROCEDURES	28
16.4.	POST EMERGENCY RESPONSE OPERATIONS	29
17.0	RECORDKEEPING	29
17.1.	WASTE MANAGEMENT RECORDS	29
17.2.	TRAINING RECORDS	30
17.3.	MEDICAL RECORDS.....	30

1.0 INTRODUCTION

The purpose of this Hazardous Waste Operations Program is to outline procedures Malcolm Pirnie will take to identify, evaluate and control safety and health hazards and provide for emergency response when working on uncontrolled hazardous waste sites. This program provides for the development of site and project specific health and safety plans, a project chain-of-command, task hazard evaluation and controls, training, medical surveillance, and record keeping procedures. The Program draws extensively from other Malcolm Pirnie Health Safety Program elements.

2.0 REFERENCES

Malcolm Pirnie is committed to conducting its operations in accordance with all federal, state, and local health and safety standards, regulations and laws. Some of those specific to this Hazardous Waste Operations and Emergency Response include:

- 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response.
- USACE EM385-1-1 November 2003

3.0 APPLICATION

Malcolm Pirnie project teams will develop a site-specific safety and health plan (SSHP) for each field project that meets the following definitions:

- Clean-up operations required by a governmental body, whether Federal, state local or other involving hazardous substances that are conducted at uncontrolled hazardous waste sites (including, but not limited to, the EPA's National Priority Site List (NPL), state priority site lists, sites recommended for the EPA NPL, and initial investigations of government identified sites which are conducted before the presence or absence of hazardous substances has been ascertained);
- Corrective actions involving clean-up operations at sites covered by the Resource Conservation and Recovery Act of 1976 (RCRA) as amended (42 U.S.C. 6901 et seq);
- Voluntary clean-up operations at sites recognized by Federal, state, local or other governmental bodies as uncontrolled hazardous waste sites;
- Operations involving hazardous waste that are conducted at treatment, storage, disposal (TSD) facilities regulated by 40 CFR Parts 264 and 265 pursuant to RCRA; or by agencies under agreement with U.S.E.P.A. to implement RCRA regulations; and
- Emergency response operations for releases of, or substantial threats of releases of, hazardous substances without regard to the location of the hazard.

Malcolm Pirnie also requires that project teams follow this program on projects may result in potential exposures to site contamination. These projects include landfill evaluations and projects where the client requires the development and implementation of SSHP.

Malcolm Pirnie projects do not typically generate or require employees to handle or dispose of hazardous waste. Remediated materials generated during remediation projects are not typically managed under the Resource Conservation and Recovery Act (RCRA). In the event that Malcolm Pirnie employees must manage hazardous waste, please refer to the Malcolm Pirnie Hazardous Waste Management Program.

4.0 SAFETY AND HEALTH RISK ANALYSIS

4.1. Project Tasks

Malcolm Pirnie Health & Safety Plans (HASPs) will include a description of the work to be accomplished and a delineation of field tasks. An evaluation of these field tasks becomes the basis of the Hazard Analysis. Suitable control strategies are devised to mitigate each hazard defined for each task.

4.2. Safety and Hazard Analysis

The following sections provide some general information on some of the typical field task hazards encountered by Malcolm Pirnie employees doing hazardous waste site investigative projects.

4.3. General Physical/Biological Hazards

Anticipated physical/biological hazards include:

- Heat stress (high ambient temperature);
- Noise;
- Slip, Trip and Fall;
- Equipment Operation;
- Electrical;
- Utility avoidance (overhead and underground);
- Falling objects; and
- Biological hazards.

4.3.1. Heat Stress

Whenever feasible, the level of protection established for workers will be based upon quantitative determinations of the radiological and chemical agents and physical stresses present in the work environment. It is proposed that work will be conducted during the summer months; therefore, heat exposure is an issue of concern.

Heat stress is probably one of the most common and potentially serious illnesses at hazardous waste sites. The potential for heat stress is dependent on a number of factors, including environmental conditions, clothing, workload, physical conditioning, and age. The effects of heat stress can range from mild symptoms, such as fatigue, irritability, and decreased mobility, to death. The body's response to heat stress includes the following:

- **Heat Rash:** A result of continuous exposure to heat and humidity, heat rash decreases the body's ability to tolerate heat.
- **Heat Cramps:** A result of profuse perspiration with inadequate fluid intake and chemical replacement, heat cramps are signaled by muscle spasms and pain in the abdomen and the extremities.
- **Heat Exhaustion:** A result of increased stress on various organs. The signs of heat exhaustion include shallow breathing; pale, cool, moist skin; profuse sweating; dizziness and lassitude.
- **Heat Stroke:** The most severe form of heat stress, heat stroke must be relieved immediately to prevent severe injury or death. The signs of heat stroke are red, hot, dry skin; no perspiration; nausea; dizziness and confusion; strong, rapid pulse; and coma. The body must be cooled and medical attention sought immediately.

Measures to prevent heat stress include regular work breaks during field activity, regular fluid replenishment, and the availability of shelter (i.e., shaded area). All personnel will be made aware of the symptoms of heat stress. Should one or more symptoms be detected, the affected worker will be assisted to seek shade, drink plenty of fluids, and seek medical attention, if required.

Several screening techniques can be used to detect early warning signs of heat stress. The following method, based on body temperature measurements, is simple and straightforward and may be conducted by the SSO. Body temperature may be measured with a digital-readout clinical ear thermometer with disposable tips.

Body temperature may be measured for three minutes with an ear thermometer at the end of each work period and before drinking. Temperature at the end of the work period should not exceed 99.6°F. If the temperature does exceed 99.6°F, the next work period should be shortened by 10 minutes (or 33%), while the length of the rest period stays the same. If the temperature exceeds 99.6°F at the beginning of the next rest period, however, the following work cycle should be further shortened by 33%.

Temperature should be measured again at the end of the rest period to make sure that it has dropped below 99.6°F. No worker may be permitted to continue wearing semi-permeable or impermeable garments when his/her temperature exceeds 100.6°F.

4.3.2. Noise

OSHA requires the use of hearing protection by all employees when noise levels exceed 85 decibels. This limit may be exceeded on or near heavy equipment. A sound level meter (SLM), operating in the dBA mode, will be used when personnel are working near heavy equipment. Site workers will wear hearing protection when the noise levels exceed 85 decibels. In addition, all Malcolm Pirnie personnel must undergo an initial employment, annual, and employment termination examination, during which a hearing test is conducted.

4.3.3. Slip, Trip and Fall Hazards

Ground irregularities due to topography or protruding materials (e.g., nails in boards, broken glass) may pose a fall, slip or trip hazard to workers. Leather shoes with puncture proof inserts will be worn by personnel to protect against sharp objects which may be protruding from the surface or when using heavy equipment. There are potential hazards from the presence of wet areas, puddles, oil and grease, debris, loose or sandy soils, or other obstructions that may be within the passageways or walkways. Field personnel will be briefed by the SSO each morning on the location and type of obvious hazards in the work areas. Site workers are to take care in areas where ground irregularities or protruding objects exist and may not be observed due to vegetation.

4.3.4. Equipment Operation

To prevent entrapment in moving machinery, Malcolm Pirnie employees will maintain a safe distance from heavy machinery. Malcolm Pirnie employees will remain outside the swing radius of heavy equipment. The PSO or designee will remind all site workers each morning about the hazards of moving equipment. Subcontractors will place a worker near moving heavy equipment to guide the operator and warn others.

4.3.5. Utility Avoidance (overhead and underground)

Underground utilities may pose an electrocution, explosion, or other hazard during excavation or drilling activities. The location of underground utilities will be determined prior to excavation or drilling. Utility companies and other responsible authorities will be contacted to locate and mark the locations, and a copy of the One Call Markout Ticket

will be retained. The Utility Association “Call Before You Dig” (instate) hotline number is 1-800-XXX-XXXX. On commercial or industrial properties where public utility companies may not have information on buried utilities, a Level 2 survey will be conducted to locate all aboveground and below ground utilities. A Level 2 survey will consist of the use of remote sensing devices (e.g., electrical resistivity, ground penetrating radar, magnetometer, etc.). On residential properties, a metal detector will be utilized to locate any buried tanks (i.e., oil) and/or subsurface piping associated with the property’s heating system.

4.3.6. Electrical

Electrical storms (thunderstorms) may pose an electrocution hazard. During thunderstorms, all heavy equipment will be shut down, drilling activities will be terminated and all personnel on-site will take refuge in buildings.

All electrical equipment, power tools, and extension lighting used on this site will be low voltage or protected by ground fault circuit interrupters (GFCIs).

4.3.7. Vehicular Traffic

Vehicular traffic will pose a hazard during some Hazardous Waste site tasks conducted in public streets. The local police department will be contacted prior to these activities, in order to make arrangements to close streets to all but local traffic. Traffic cones will be set across all street intersections to restrict the flow of traffic into the work areas. In addition, warning signs (e.g., Work Ahead) will be posted at all street intersections. All personnel will wear bright-colored, reflective traffic safety vests while performing street scanning activities.

4.3.8. Falling Objects

There maybe a danger of falling objects on a particular project. In these cases, the entire area inside the exclusion zone is a hard hat area. Hard hats will also be worn within 50 feet of drilling operations or other activities posing an overhead hazard.

4.3.9. Biological Hazards

Persons working on Hazardous Waste sites should be aware of the presence of biological hazards including snakes, poisonous plants and poisonous insects. With the exception of some rare species of poisonous snakes, snakes will not attack unless provoked. All snakes encountered should be avoided. If a snake is discovered, the PSO should be

immediately informed of the snake's location, size and type, if known. In most cases, only a brief interruption of work will be necessary to allow the snake to vacate the work area on its own.

Poison ivy is a climbing plant with ternate leaves (arranged in threes), with white berries. Poison oak is similar to poison ivy, but its leaves appear oak-like in form. The leaves of these poisonous plants produce irritating oil causing an intensely itching skin rash and characteristic bullous lesions. These plants are to be avoided.

Working in tall grass, especially in or at the edge of wooded areas, increases the potential for ticks to bite workers. Ticks can be particularly numerous in the spring and fall. Ticks are vectors of many different diseases including Rocky Mountain spotted fever, Q fever, tularemia, Colorado tick fever and Lyme disease. Ticks attach to the skin and intravenously feed on blood, creating an opportunity for disease transmission. Covering exposed areas of the body and the use of insect repellent containing N,N-Diethyl-m-toluamide (DEET) help prevent tick bites. Periodically during the workday, employees should inspect themselves for the presence of ticks. If a tick is discovered, the following procedure should be used to remove it:

- Do not try to detach a tick with your bare fingers; bacteria from a crushed tick may be able to penetrate even unbroken skin. Fine-tipped tweezers should be used.
- Grip the tick as close to your skin as possible and gently pull it straight away from you until it releases its hold.
- Do not twist the tick as you pull and do not squeeze its body. That may actually inject bacteria into your skin.
- Thoroughly wash your hands and the bite areas with soap and water. Then apply an antiseptic to the bite area.
- Save the tick in a small container with the date, the body location of the bite and where you think the tick came from.
- Notify the PSO of any tick bites as soon as possible.

Recently, Lyme disease has been the most prevalent type of disease transmitted by ticks in the United States. Ticks transmit other diseases similar to Lyme disease, which present similar symptoms and long-term consequences. All personnel sustaining a tick bite should consult a physician.

5.0 SOCIAL CONDITIONS

Malcolm Pirnie field personnel are to be knowledgeable of the general conditions currently existing within their study areas. Malcolm Pirnie personnel should be cognizant of their surroundings at all times while in the field. If deemed necessary, Malcolm Pirnie field personnel will be accompanied by armed security guards during excursions to site properties during field activities. Local law enforcement authorities will be contacted prior to the commencement of field activities, and letters conveying general project information will be distributed to public officials and property owners. Actions required of all Malcolm Pirnie personnel include conducting field activities with at least two field team members, finishing all field activities during daylight hours, and limiting the public visibility of Malcolm Pirnie field personnel while activities are being conducted. In addition, all field personnel will be required to carry two-way radios, have access to a cellular phone, and have identification badges identifying themselves as Malcolm Pirnie employees.

6.0 HEALTH AND SAFETY ORIENTATION TRAINING

Required OSHA training will be conducted by qualified trainers that have successfully completed an appropriate program for training or have adequate academic credentials and instructional experience.

Malcolm Pirnie and subcontractor personnel involved with the investigation activities are required to have completed the 40-hour hazardous materials health and safety training as specified in 29 CFR 1910.120. This training, designed to orient personnel potentially exposed to hazardous substances, health hazards, or safety hazards, includes the following:

- Safety and health risk analysis;
- Use of PPE;
- Work practices by which the employee can minimize risks from hazards;
- Safe use of engineering controls and equipment;
- Medical surveillance requirements including recognition of symptoms and signs which might indicate overexposure to hazards;
- Procedures for environmental monitoring, site control and decontamination; and
- Emergency response plans.

All personnel will also have proof of attendance at an annual 8-hour Health and Safety refresher course if their 40-hour course was completed more than a year prior to the start of field activities. In addition, a minimum of two field personnel with current First Aid/ CPR/Bloodborne Pathogens Training (FA/CPR/BBP) will be present on-site during all field activities. A copy of all current training certificates will be kept in the project field notebook.

For those projects with potential radiological exposure from contaminants in the ground, a project-specific radiation orientation program will also be developed and presented to all field personnel before any work begins.

7.0 SPECIALIZED TRAINING

Malcolm Pirnie, subcontractor, and other field personnel are to be knowledgeable in the particular hazards that may be encountered during this project and be familiar with safe operating procedures. This will be accomplished through the review of this HASP, specialized training prior to the commencement of the field work, an audit of field activities and safety meetings during the program, as discussed below.

Field personnel should have a minimum of three days of actual field experience under a skilled supervisor and be familiar with emergency response procedures outlined in the HASP. The PSO and all supervisory personnel will have additional training, including FA/CPR/BBP and 8-hour hazardous materials supervisory training. Subcontractors will be responsible for ensuring that their employees receive specialized training for their job functions and responsibilities.

7.1. Pre-Investigation Health and Safety Briefing

Malcolm Pirnie and subcontractor personnel involved with the project will attend a site-specific health and safety briefing prior to initiation of the field activities. The topics to be discussed will include:

- Characteristics and potential hazards of contaminants known to be present at the site;
- Personal protective clothing: function, donning/doffing;
- Respirators: selection, use, care;
- Personal hygiene;
- Environmental monitoring;
- Decontamination procedures;
- Site control and work zone designations;
- General safety concepts;
- Emergency recognition and prevention;
- Heat stress;
- Signs and symptoms of over exposure to site specific chemical hazards;
- Hazard communication
- Emergency response plan; and
- Site contingency plans.

7.2. Site/Radiation Orientation Program

For applicable projects, the Site/Radiation Orientation Program will be provided to on-site Malcolm Pirnie and subcontractor personnel. The orientation, which will be in compliance with USACE Safety and Health Requirements Manual EM 385-1-1, November 2003, will cover the following topics:

- Basic principles of radiation
- Health effects
- Radiation detection.
- Contamination control/emergency response
- Transportation of radioactive materials
- Radiation risk communication

7.3. Health and Safety Field Audit

The PSO shall observe field investigation activities and prepare a Health and Safety Field Audit Report (HSFAR), which addresses hazardous waste operations from a safety perspective. The audit will evaluate the health and safety activities implemented by the field sampling team in accordance with the HASP. Any minor deficiencies that are noted during the audit will be corrected in the field as they occur. If major deficiencies are noted during the audit (those that cannot be immediately corrected in the field), a Stop-Work Order will be issued by the Project Manager until appropriate measures can be taken to correct the problem. A written report of the Health and Safety audit will be prepared by the PSO and submitted to both the HSM and the Project Manager. This report will identify any deficiencies found and will outline the corrective actions that were recommended/implemented to address any minor deficiencies observed. The audit report will also recommend appropriate corrective actions for any major deficiency noted.

The Project Manager will assist with corrective action and maintain an on-going log of the audit activities in the monthly progress report. The Project Manager will submit follow-up reports to the client's PM (as required), describing completed corrective actions that addressed major deficiencies. A minimum of one Health and Safety audit will be conducted by the PSO during the investigations.

7.4. Morning Safety Meetings

The PSO or designee shall conduct morning safety and health briefings on an as-needed basis. Problems relative to respiratory protection, inclement weather, heat stress, or the interpretation of newly available environmental monitoring data are examples of topics that might be covered during these briefings. An outline report of meetings giving the date, time, attendees, subjects discussed, and instructor shall be. Visitors will be properly oriented to existing site

conditions, planned activities, levels of personal protection, and other procedures outlined in this HASP.

8.0 HAZARD COMMUNICATION

Malcolm Pirnie has a written hazard communication program which was established to meet the requirements of 29 CFR 1910.1200, and field activities shall be implemented in accordance with that program, as described below.

Material Safety Data Sheets (MSDSs) for hazardous chemicals introduced to the site by Malcolm Pirnie and their subcontractors will be present at the site, for review by all on-site personnel and maintained in the Project notebook. Labels on containers used by Malcolm Pirnie are as originally received (not to be defaced) and are to contain the following information: (1) the identity of the hazardous chemical(s); (2) the appropriate hazard warnings; and (3) the name and address of the chemical manufacturer. If an employee transfers chemicals from a labeled container to a portable container, a label that contains those three items must be affixed to it. If the portable container is used by one employee during one work shift, the product name only shall be clearly marked on the container. The employee will be responsible to properly empty, clean or dispose of the portable container immediately after use.

The PSO shall make a reasonable effort to obtain the appropriate hazard communication information for hazardous chemicals introduced by other employers: This information will include:

- Explanation of that firm's labeling system;
- The name and location of each hazardous chemical, and location of MSDSs; and,
- Precautionary measures other employers need to take to protect their employees from harmful exposure to hazardous chemicals under normal operating conditions and in foreseeable emergencies.

As part of the site-specific health and safety orientation conducted by the PSO, a review of Malcolm Pirnie's Hazard Communication Program will be included to inform employees of hazardous chemicals to which they may be exposed during field activities. Subcontractors will also attend the hazard communication training session. If the chemical hazard changes or a new chemical hazard is introduced into the area after work begins, additional training will be provided by the PSO.

Site-specific hazard communication training for hazardous chemicals introduced to the site by Malcolm Pirnie will include:

- Properties and hazard (chemical, physical, toxicological) of each hazardous chemical;
- Health hazards, including signs and symptoms of exposure and any medical condition known to be aggravated by exposure;
- Measures employees can take to protect themselves, including: appropriate work practices or methods for proper use and handling, procedures for

emergency response, and the proper use and maintenance of PPE, as required.

- Work procedures for employees to follow to protect themselves when cleaning hazardous chemical spills and leaks.
- Use of the container labeling system and the MSDSs including: where MSDSs are located, how to read and interpret the information on both labels and MSDSs, and how employees may obtain additional hazard communication information.
- Site-specific hazard communications training will also cover hazardous chemicals introduced by other employers and shall emphasize:
- Information about the hazardous chemicals to which Malcolm Pirnie's employees may be exposed;
- An explanation of the labeling system other employers are using;
- Information about the precautionary measures Malcolm Pirnie employees need to take to protect themselves during normal operating conditions and in emergencies; and,
- Location of MSDSs for hazardous chemicals brought to the site by other employers.

The PSO shall document the training, including the agenda and list of attendees. This subsection of the HASP, and the hazard communication training conducted as described above, shall be the mechanism for informing other employers planning to be on-site of hazardous chemicals introduced to the site by Malcolm Pirnie.

9.0 MEDICAL SURVEILLANCE AND EXPOSURE MONITORING

9.1. Medical Surveillance

All Malcolm Pirnie personnel and subcontractors performing fieldwork that could potentially expose them to hazardous materials are required to take part in a medical surveillance program that is consistent with the requirements of 29 CFR Part 1910.120 (f). This includes any employees that may be exposed to hazardous materials or wear a respirator for 30 days or more per year.

Medical examinations, conducted at no cost to the employee, will occur prior to the work assignment and then annually. When an employee is reassigned to work areas where medical surveillance is not a requirement or when employment is terminated, a final medical examination will be conducted if the previous evaluation has not been within the last six months.

A medical examination should be conducted quickly after an emergency incident or when an employee is suffering from symptoms associated with overexposure. Additional medical evaluation can be scheduled at the discretion of the PSO, the Director, Environmental Health & Safety or our designated medical consultant.

Subcontractors will maintain medical records for their own employees, but will also provide the Malcolm Pirnie with written documentation certifying that each employee on site has met the requirements of the OSHA Medical Surveillance Program, is cleared for duty, and indicates any work restrictions that may impact the performance of job tasks.

Supplemental Examinations - Supplemental examinations may be performed whenever there is an actual or suspected excessive exposure to chemical contaminants or upon experience of exposure symptoms, or following injuries or temperature stress.

10.0 PERSONAL PROTECTIVE EQUIPMENT

10.1. General Protection Levels

Personnel must wear protective equipment when work activities involve known or suspected radiological or chemical atmospheric contamination; when vapors, gases, or particulates may be generated; or when direct contact with dermally active substances may occur. Respirators can protect the lungs, the gastrointestinal tract and the eyes against air toxicants. Chemical-resistant clothing can protect the skin from contact with skin-destructive and skin absorbable chemicals. Good personal hygiene limits or prevents the ingestion of materials.

The personal protective equipment used during specific activities is based on air monitoring results or at the discretion of the Project Safety Officer. If the Project Safety Officer determines that field measurements or observations indicate that a potential exposure is greater than the protection afforded by the personal protective equipment, work will stop and personnel will be removed until the level of exposure has been decreased or the level of protection has been increased.

Equipment designed to protect the body against contact with known or anticipated chemical hazards has been divided into four categories according to the degree of protection afforded:

Level A: Should be selected when the highest level of respiratory, skin and eye protection is needed. It includes:

- Pressure-demand SCBA
- Fully Encapsulating Chemical-resistant Suit
- Inner and outer Chemical Resistant Gloves
- Chemical Resistant boots with steel toe
- Hard Hat
- Two-way radio communications

Level B: Should be selected when the highest level of respiratory protection is needed, but a level of skin protection lower than Level A is required. It includes:

- Pressure-demand SCBA
- Chemical-resistant clothing (overalls and long-sleeve jacket; coveralls; hooded one- or two-piece chemical splash suit; disposable chemical-resistant coveralls)
- Inner and outer Chemical Resistant Gloves
- Chemical Resistant boots with steel toe
- Hard Hat
- Two-way radio communications

Level C: Should be selected when the types of airborne contaminants are known, the concentrations have been measured and the criteria for using air-purifying respirators are met. Level C requires the use of:

- A full-face air-purifying respirator equipped with an organic vapor, dust, fumes and mists combination cartridge
- Chemical-resistant Clothing
- Chemical-resistant Gloves
- Chemical Resistant boots with steel toe
- Hard Hat

Level D/Modified Level D: Level D should be selected only when there are no respiratory or skin hazards suspected or known to exist at the site. Modified Level D PPE is selected when no respiratory hazards are suspected or known to exist, yet the potential for dermal hazards including contact with contaminated soils, splashes or immersion exists. If the potential for splashes or immersion exists, coated-type chemical resistant coveralls (such as Saranex) and hard hats with face shields could be selected. If the only dermal hazards which existed were related to soil sampling, a non-coated semipermeable-type coverall (such as Tyvek) could be selected, thereby avoiding the heat stress hazards associated with an impermeable coverall.

The level of protection selected is based primarily on:

- Types and measured concentrations of the contaminants in the ambient atmosphere and their associated toxicity; and,
- Potential or measured exposure to substances in air; splashes of liquids; or, other indirect contact with material due to the task being performed.

In situations where the types of contaminants, concentrations, and possibilities of contact are not known, the appropriate level of protection must be selected based on professional experience and judgment until the hazards may be further characterized. The individual components of clothing and equipment must be assembled into a full protective ensemble to protect the worker from site-specific hazards, while at the same time minimizing hazards and drawbacks of the

personal protective gear itself. Ensemble components outlined in the following subsection are based on the widely used USEPA Levels of Protection.

In general:

- All protective headgear shall meet the requirements of the American National Standards Institute (ANSI) Z89.1, Class A or ANSI Z89.2, Class B.
- Personnel will be provided with eye and face protective equipment when machines or operations present potential eye or face injury from physical, chemical or radiological agents. Eye and face protective equipment shall meet the requirements in ANSI Z87.1, Practice for Occupational and Educational Eye and Face Protection.
- Persons requiring corrective lenses in eyeglasses, when required by this regulation to wear eye protection, will be protected by one of the following:
 - Eyeglasses whose protective lenses provide optical correction; or
 - Goggles that can be worn over corrective lenses without disturbing the adjustment of the spectacles; or goggles that incorporate corrective lenses mounted behind the protective lenses.
- Use of contact lenses will be avoided. Contact lens use will not be permitted under a full-face respirator. Spectacle kits for insertion into full-face respirators will be provided for Malcolm Pirnie personnel as required.
- If excessive noise levels are encountered, particularly around heavy equipment operation, noise protection shall be provided as appropriate.
- Persons handling rough, sharp-edged, abrasive materials or whose work subjects the hand to lacerations, punctures, burns, or bruises will use general-purpose outer hand protection in addition to the chemical resistant inner and outer gloves, as required.
- Employees will wear clothing suitable for the weather and work conditions. The minimum will be long sleeved shirt, long trousers, and protective work shoes or boots. Canvas tennis or deck shoes are not acceptable.
- Protective footwear (i.e., steel-toed or steel sole boots) will be worn by all persons who are engaged in the work.
- Respiratory protection approved by NIOSH shall be provided for all employees subject to harmful concentrations of dusts, gases, fumes, mists, toxic materials, or atmospheres deficient in oxygen.
- No person will be permitted in atmospheres containing less than 19.5 percent oxygen unless provided with a source of air meeting USP or Compressed Gas Association Specification G7.1, grade D.
- Air purifying respirators will be permitted only where the toxic content of the air is known to be of type and concentration which the mask will effectively remove, has good warning properties, and where there is no deficiency of oxygen.

- PPE will be inspected regularly and maintained in serviceable and sanitary condition and before being reissued to another person or returned to storage, will be cleaned, disinfected, inspected, and repaired.

10.2. Inspection of PPE

Before use of protective clothing, the PSO shall determine that the clothing material is correct for the specified task at hand. The clothing is to be visually inspected for imperfect seams, non-uniform coatings, tears and malfunctioning closures. It is to be held up to the light to check for pinholes. It is to be flexed to observe for cracks or other signs of shelf deterioration. If the product has been used previously, it should be inspected inside and out for signs of chemical deterioration, such as discoloration, swelling and stiffness. During work, the clothing should be periodically inspected by the PSO for evidence of chemical deterioration, closure failure, tears, punctures and seam discontinuities.

Before using gloves, check for pinhole leaks. Prior to use, air-purifying respirators should be checked for positive and negative fit. Before and after each use, they should be inspected to be sure they have been adequately cleaned. Respirator components should be checked for pliability, deterioration or distortion. Cartridges should be examined to ensure that they are the proper type for the intended use, the expiration date has not passed, and that they have not been opened or used previously. Face shields and lenses should be checked for cracks, crazing and fogginess. Equipment that is found to be defective must be replaced immediately.

11.0 EXPOSURE MONITORING

11.1. General

The purpose of the air-monitoring plan is to evaluate the exposure potential to site personnel, subcontractors, and visitors during perimeter monitoring and related site screening activities. The personal and area-monitoring will be performed during each of the initial phases to determine the exposure potential, confirm the type of and evaluate the need for personal protective equipment. Personnel are not expected to place themselves in a hazardous position when in the exclusion zone during active drilling activities. Repeat monitoring will be performed when there is a change in personnel, scope of work, symptoms experienced by field staff, or readings indicating that the action level was reached or exceeded.

Emergency response actions and PPE selection will be based on monitoring results. The following instruments are available and typically used for Hazardous Waste site projects:

- MiniRAE photoionization detectors (PID);
- Oxygen/combustible gas indicators (CGI);

- Personal dataRam Dust Monitors
- Drager Pumps and Tubes
- Jerome Mercury and Hydrogen Sulfide Detectors
- Gamma radiation scintillation (sodium iodide) detectors
- Thermoluminescent dosimeters (TLDs).

Prior to the start of work, an initial monitoring survey will be conducted to establish background conditions. During site activities, the monitoring instruments will be operated on a continuous basis in the work area. If contaminant levels in the breathing zone exceed those specified in the HASP, the prescribed PPE will be used or the area will be evacuated in accordance with the Emergency Response Procedures.

Contaminant concentrations detected, instrument type and calibration data will be recorded. All instrumentation will be calibrated before use; periodic calibration checks will be made by the PSO or designee and documented over the duration of the work activities.

Instrumentation will be maintained in accordance with the manufacturer's specifications. Monitoring instruments will be protected from surface contamination during use to minimize the need for decontamination.

Personnel assigned to radioactive waste sites for five or more days or more will be issued a TLD. These will be collected quarterly and the dosimetry results will be disclosed; results will be included in the employee's medical surveillance record.

11.1.1. Minirae Photoionization Detector

MiniRAE PIDs are used to monitor the breathing zone of field personnel to assess the presence of volatile organic vapors.

11.1.2. Oxygen Combustible Gas Indicator (CGI)

CGIs are used to monitor for the presence of explosive atmospheres and oxygen concentrations in areas such as pits, depressions, excavations, on-site buildings, or confined spaces where there may be low oxygen levels and/or flammable gases might collect. Each instrument will be set to alarm when the atmosphere being tested has reached a concentration equal to 10% of the LEL of methane and/or oxygen less than 19% or higher than 23.5%.

11.1.3. Personal dataRAM

Personal dataRAMs are used to obtain real-time particulate dust measurements. Action levels are determined by assessing the expected contaminant concentrations in the soil.

11.1.4. Gamma Radiation Scintillation Detector

On radiation sites, gamma radiation scintillation detectors will be used to continuously monitor the radiation exposure rate in the work areas. The Project Health Physicist will guide field personnel in the interpretation of the monitoring data and provide guidance so that personnel doses will be kept as low as reasonably achievable (ALARA).

11.1.5. Drager Pumps and Tubes

Drager pumps and tubes are used to qualify PID results to determine if low PEL compounds including Benzene and Vinyl Chloride may be present in the work area air. The presence or absence of these compounds may determine the PPE Level required for a particular phase of the work.

11.1.6. Jerome Mercury and Hydrogen Sulfide Detectors

Jerome Mercury and Hydrogen Sulfide Detectors are very sensitive real-time detectors useful for detecting general concentrations and well as point sources of mercury contaminant or hydrogen sulfide releases.

11.2. Personal Monitoring

Personal air monitoring will be conducted during various phases of the project to determine the exposure potential to project staff. This monitoring will occur in the breathing zone and work area during sampling activities to assess the employee exposure potential to contaminants. The analytical results will be posted in the site trailer and/or communicated to field staff. The concentrations and real time readings will determine the need to increase the distance of the exclusion zone and the need to upgrade the level of personal protective equipment. The determination to perform subsequent personal monitoring will be made by the PSO after discussions with the Project Manager.

12.0 ACTION LEVELS FOR WORK AREA MONITORING

Action Levels are developed based upon the contaminants present of the site, the likelihood of the contaminants becoming airborne or the likelihood of physical contact. Airborne contaminant action levels are based on the PEL or ACGIH TLV of the compound(s) with the highest calculated atmospheric concentration and the sensitivity of the instrument to those compounds. For single compounds, Malcolm Pirnie uses ½ the PEL or TLV, which ever is the most protective, modified by the instrument sensitivity.

12.1. Exposure Monitoring/Air Sampling Program

Instrument	Action Levels	Level of Respiratory Protection
PID	Continuous sustained readings of <5 ppm above background in the breathing zone and no visible dust	Level D
Particulate Meter	Readings of <5 mg/m ³ total particulates	Level D
PID	Sustained (> 5 min.) readings > 5 ppm but < 50 ppm above background in the breathing zone and/or sustained dust clouds	Level C
Particulate Meter	Sustained readings of >5 mg/m ³ <15 mg/m ³ total particulates	Level C
Explosive vapors/CGI	< 19.5% oxygen, >23.5% oxygen, or > 10% LEL	Leave Area
Explosive vapors/CGI	>19.5% oxygen, < 23.5% oxygen, or < 10% LEL	Level D
Draeger tubes	Use benzene or vinyl chloride tubes when sustained VOC readings on the PID/FID are above 1.0 ppm above background in the breathing zone. If results are <1.0 ppm: use level D.	Level D
Draeger tubes	Use benzene or vinyl chloride tubes when sustained VOC readings on the PID/FID are above 1.0 ppm above background in the breathing zone. If results are >1.0 ppm: leave area of exposure and upgrade to Level B as necessary.	Leave area or Level B

13.0 SITE CONTROL MEASURES

OSHA requires that Malcolm Pirnie initiate engineering and work practice controls, to the extent feasible, to minimize the potential for employee exposure to chemical, biological, physical, or mechanical hazards. Site control measures help maintain order at the site and minimize health and safety hazards to on-site personnel, visitors, and the public.

13.1. Engineering Controls

In accordance with best management practices, engineering control measures will be utilized on site to provide a safe environment. Such controls include, but

are not limited to, the use of fencing, clearly defined work areas, personal protective equipment, monitoring equipment, proper decontamination procedures, and personnel training.

13.2. Site Access

Malcolm Pirnie personnel will abide by any security restrictions and guidelines imposed by facility owner/operators. Site access will be limited to trained, medically cleared, essential personnel only. Appropriate warning signs will be posted at the entrance to the site, at the site trailer (if appropriate), and in areas where special personal protective equipment or precautions must be afforded. Personnel will be courteous to the public and direct all questions to the appropriate owner/operator representative on site.

The PSO shall be responsible for controlling access to the site. Only authorized, qualified personnel are allowed on-site during the performance of the field activities. Personnel desiring access to the site will be required to sign in at the trailer and receive a site safety briefing, as appropriate.

13.3. Establishment of Work Zones

Site control zones include exclusion zones; contaminant reductions zone, and support zones and will be maintained by the PSO. No equipment will leave the site without being decontaminated. A detailed map of site work areas, including exclusion zones, reduction zones, and support zones will be provided for each site managing hazardous waste.

The PSO shall establish an area to provide portable eyewash, first aid kit, towels, plastic garbage bags, fire extinguisher, and decontamination supplies. Access to the work zones will be controlled so that personnel entering the areas are wearing the proper personal protective equipment and proper training and medical clearance.

Temporary work zones shall be established at each location of soil intrusive and/or sampling location. The PSO shall be responsible for establishing a contamination reduction zone directly adjacent to these work zones. The contamination reduction zone shall have available a portable eye wash, first aid kit, towels, plastic garbage bags, fire extinguisher, and decontamination supplies.

13.4. Exclusion Zone

During site activities, the PSO will establish an exclusion zone. The exclusion zone will be set up around the large diameter auger drilling activities. Some type of barricades or fencing shall be established to identify the area as the exclusion zone. Smoking, eating, drinking, and chewing tobacco will not be permitted in

the exclusion zone. Personnel entering the exclusion zone shall be limited and only personnel with the proper training and medical clearance may enter. Personnel entering the exclusion zone must wear required personal protective equipment (e.g., Tyvek, rubber steel toed boots, eye protection, hearing protection and gloves).

13.5. Contaminant Reduction Zones

The contamination reduction zone will be established by the PSO as a buffer zone between the work zones and the support zone. When possible, the contaminant reduction zone should be located upwind of an exclusion zone. Smoking, eating, drinking, and chewing tobacco will not be permitted in the contaminant reduction zone. An area for the proper disposal and/or cleaning of personal protective equipment shall be established in the contaminate reduction zone.

13.6. Support Zone

The support zone is considered the clean area and consists of any area outside the work zone and contaminant reduction zones. The command post, appropriate sanitary facilities; safety, medical and support equipment will be located within the support zone. Potentially contaminated personnel or materials are not allowed in the support zone. Drinking of water/fluids is permitted in this area. A designated smoking area will be established near the site/field trailer and housekeeping will be enforced at the site throughout the project.

The support zone is considered the uncontaminated area in the vicinity of the work zone and will be identified by the PSO before field activities begin. It will contain the command post, which will provide for team communications and emergency response. A mobile telephone will be located in this area. Appropriate sanitary facilities, safety, medical and support equipment will be identified. No potentially contaminated personnel or materials are allowed in the support zone.

14.0 DECONTAMINATION PROCEDURES

Decontamination procedures have been developed in order to minimize employee, subcontractor, or visitor contact with hazardous substances. Decontamination procedures for personnel and equipment will be communicated with Malcolm Pirnie employees prior to commencement of work activities.

14.1. Personnel Decontamination Procedures

The Project Manager will be responsible for supervising the proper use of personal protective equipment and decontamination of personnel prior to them

leaving contaminated areas. When decontamination procedures are not sufficient or are not being followed, the Project Manager will correct any deficiencies.

Personnel decontamination will be established by the Project Manager in an area that will minimize the exposure to uncontaminated employees and equipment. Personnel will decontaminate and/or dispose of soiled protective clothing in the contamination reduction zone established next to the temporary work zones. Unauthorized personnel will not remove protective clothing or equipment from any work zones.

Decontamination involves scrubbing with a soap and water solution followed by rinses with potable water. Dirt, oil, grease, and other foreign materials that are visible will be removed from surfaces. Rinse water used in personnel decontamination will be disposed with wastewater from equipment decontamination and drummed for laboratory analyses and proper disposal thereafter.

Non-disposable garments will be air-dried prior to storage. Tyvek, gloves, and other disposable personal protective equipment will be disposed of with applicable hazardous waste and replaced as necessary. When employee clothing inadvertently comes in contact with a hazardous substance.

A wash basin will be made available to site personnel to ensure proper personal hygiene procedures are implemented throughout the project phases. If cold weather conditions prevent the use of water, other effective cleansing means will be provided. When required, regular showers and change rooms will be provided outside of the contaminated area in accordance with 29 CFR 1910.120(k)(8). Personnel are required to wash their hands/faces prior to eating, drinking or smoking after conducting sampling or oversight activities at a site.

14.2. Personnel Decontamination Equipment

The following supplies can be made available onsite for personnel decontamination when appropriate:

- Plastic drop cloths;
- Plastic wash tubs;
- Long-handled brushes;
- Alconox®, water, alcohol-free or antimicrobial wipes, and towels to wash hands, face, and respirators;
- Mineral spirits or orange based cleaning agent for tool and equipment decontamination (use chemical resistant gloves and splash goggles, do not use mineral spirits around ignition sources); and
- Hand spray units.

14.3. Equipment Decontamination

Equipment decontamination will consist of removing all visible soil with a shovel, broom, or rags followed by washing with a cleaning agent and rinsing with potable water. Decontamination water will be collected for disposal as required by site conditions.

In some cases, it may be necessary to wash equipment with a high pressure hot water (steam clean) and detergent. Alconox should be utilized to remove all residuals. Equipment must be scrubbed until all visible dirt, grime, grease, oil, etc. have been removed. Equipment must be decontaminated prior to its departing the site or excavation area. After steam cleaning and detergent rinse, equipment must be rinsed with potable (tap) water.

15.0 COLLECTION, STORAGE AND DISPOSAL PROCEDURES

Cutting, purge wastes, and field decontamination wastes are to be collected, drummed, and disposed of in accordance with the Federal, State and Local regulations. Handling drums and carboys associated with investigation-derived waste can be dangerous. Personnel should fill carboys only half way to avoid back strain and spilling water when lifting or tipping the carboy. When pouring waste from a carboy into a 55-gallon drum, personnel should try to avoid spilling any water and use proper lifting techniques. When handling 55-gallon drums, extra caution should be exercised due to the weight of the drums. If the drum lid is removed to sample the drum, personnel should avoid breathing any odors that may escape.

16.0 HAZARDOUS WASTE EMERGENCY RESPONSE

For all worksites where hazardous substances may be released, Malcolm Pirnie will have an Emergency Response Plan as part of the site-specific health and safety plan. The site-specific health and safety plan will be completed prior to commencement of work activities and will be kept onsite and made available for all employees to review.

Under the site-specific health and safety plan, training requirement will be outlined to ensure that all personnel will be trained based on their duties and functions and will receive necessary annual refresher training. Training records will be kept by the Corporate Health & Safety and training will be conducted by trainers that have completed appropriate training courses and/or have adequate academic and instructional experience.

Emergency Response Plan

In accordance with 29 CFR 120(q)(2), site-specific emergency response plans must contain the following elements:

- Pre-emergency planning and coordination with outside parties;
- Personnel roles, lines of authority, training and communications;
- Emergency recognition and prevention;
- Safe distances and places of refuge;
- Site security and control;
- Evacuation routes and procedures;
- Decontamination;
- Emergency medical treatment procedures;
- Emergency alerting and response procedures;
- Critiques of response and cleanup;
- Personal protective equipment and emergency equipment; and
- Use of local or state emergency plans to avoid duplications.

16.1. Key Personnel

16.1.1. First Responder Awareness Level

All Malcolm Pirnie employees onsite in work areas where the potential exists for hazardous substance releases will, at a minimum, be trained at the first responder awareness level. At the first responder awareness level, individuals are able to initiate the emergency response sequence (i.e. notify proper authorities) upon discovering a release. At this level, Malcolm Pirnie personnel will either have training or sufficient experience in order to demonstrate competency in the following areas:

- Hazardous substance characteristics and risks and outcomes associated with their release;
- Hazardous substance recognition in the event of an emergency;
- Hazardous substance identification (whenever possible);
- Role of first responder awareness personnel within the site-specific emergency response plan, site security, and US Department of Transportation's Emergency Response Guidebook;
- Recognition of need for additional resources and, in recognizing these needs, properly notifying required contacts.

16.1.2. First Responder Operations Level

When deemed necessary by the Project Manager and with the concurrence of the Director, Environmental Health and Safety, the Project Manager will arrange to staff the project with personnel trained at the first responder operations level. At the first responder operations level, these personnel will be able to initially respond to a hazardous substance release and minimize the impact of the release on nearby persons, property, or the environment. First responder training will allow personnel to respond to a hazardous substance release in a defensive manner and to contain the

release (if possible) from a safe distance, keep it from spreading, and prevent exposures. The training must be at least 8 hours and provide employees with competency in the following areas:

- Basic hazard and risk assessment techniques;
- Proper selection and use of personal protective equipment available to first responders;
- Basic hazardous material terms;
- Basic control, containment, and/or confinement operations within the capabilities of the available personal protective equipment;
- Decontamination procedures; and
- Relevant standard operating and termination procedures.

16.1.3. Hazardous Materials Technician

When deemed necessary by the Project Manager and with the concurrence of the Director, Environmental Health and Safety, the Project Manager will arrange to staff the project with personnel trained as a hazardous materials technician. As a hazard materials technician, individuals will be able to approach the point of release and attempt to stop or contain it. At least 24 hours of training equal to the first responder operations level is required and will confer understanding of the following:

- Emergency response plan implementation as outlined in the site-specific health and safety plan;
- Identification, classification, and verification of known and unknown onsite substances and an understanding of the hazards or potential hazards associated with those substances;
- Hazardous material technician's role in the emergency response plan;
- Selection of required personal protective equipment;
- Performance of advance control, containment, and/or confinement operations within the resources available onsite;
- Decontamination procedures;
- Termination procedures; and
- Interpret chemical and toxicological terminology and exposure characteristics.

16.1.4. Hazardous Materials Specialist

When deemed necessary by the Project Manager and with the concurrence of the Director, Environmental Health and Safety, the Project Manager will arrange to staff the project with personnel trained as a hazardous materials specialist. A hazardous materials specialist has duties similar to that of the hazardous materials technician; however, the specialist has a

more specific knowledge of the hazards associated with the release. At least 24 hours of training equal to the hazardous materials technician level is required to have additional understanding of the following:

- Emergency response plan implementation as outlined in the site-specific health and safety plan;
- Identification, classification, and verification of known and unknown onsite substances by using advanced survey instruments and equipment;
- Selection and use of required personal protective equipment available for hazardous materials specialists;
- Performance of specialized control, containment, and/or confinement operations within the resources available onsite;
- In-depth knowledge of hazard and risk techniques;
- Decontamination procedures;
- Development and implementation of site-specific health and safety plan;
- Interpret chemical, radiological, and toxicological terminology and exposure characteristics; and
- State-specific emergency response plan.

16.1.5. On Scene Incident Commander

When deemed necessary by the Project Manager and with the concurrence of the Director, Environmental Health and Safety, the Project Manager will arrange to staff the project with personnel trained as an On Scene Incident Commander. Incident Commanders assume control of the scene and will receive at least 24 hours of training equal to the first responder operations level and will know how to:

- Implement the local and corporate emergency response plan;
- Interpret the hazards and risks associated with employees utilizing personal protective equipment;
- Implement any applicable state emergency response plan and initiate the federal regional response team action; and
- Value the importance of decontamination procedures.

16.2. Emergency Response Organization

The PSO is the senior emergency response official who will respond to all releases of hazardous substances. In the event that Malcolm Pirnie's Director of Environmental Health & Safety is onsite, he/she will be considered the senior emergency response official.

The senior emergency response official will identify all hazardous substances, evaluate site conditions, and use engineering controls to minimize exposure to onsite personnel. Based on the site evaluation, the senior emergency response

official implements appropriate emergency operations and enforced the use of adequate personal protective equipment as outlined in the site-specific emergency response plan. The senior emergency response official will ensure that employees exposed to inhalation hazards during emergency response procedures will use positive pressure self-contained breathing apparatus (SCBA) unless air monitoring has indicated that decreased level of respiratory protection is allowed. The number of personnel allowed access to the emergency site will be restricted as per the judgment of the senior emergency response official. Backup personnel will be assigned by the senior emergency response official to stand by and offer immediate assistance or rescue as needed.

A safety official will be designated by the senior emergency response official. The safety official will be knowledgeable of emergency operations underway and will be tasked with identifying and evaluating hazards that arise during such operations. If the safety official determines that emergency site conditions may be IDLH, the safety official has authority to alter, suspend, or terminate relevant activities.

When emergency operations have ended, the senior emergency response official will implement and oversee decontamination procedures outline in the emergency response plan.

The Malcolm Pirnie Director, Environmental Health & Safety is notified in the event of any release of hazardous substances.

The Director, Environmental Health and Safety is to be notified when the hazardous substances introduced to the worksite or under control of Malcolm Pirnie employees have the potential to result in a large release (greater than 55 gallons). The Director, Environmental Health and Safety will see to the following:

- The site-specific health and safety plan properly addresses all hazards and control measures needed;
- All onsite Malcolm Pirnie staff have received training to satisfy the requirements of their duties as outlined in the site-specific health and safety plan; and
- As necessary, contracting a readily available HAZMAT response team approved by Corporate Health and Safety.

16.3. Emergency Response Procedures

For hazardous substances introduced to the worksite or under control of Malcolm Pirnie employees, releases would be considered incidental and would be controlled in the immediate area of the release. Releases shall be handled by Malcolm Pirnie staff (who are trained accordingly) in accordance to their level of training and roles and duties assigned in the site-specific health and safety plan. Malcolm Pirnie staff will always utilize appropriate precautions based on the

chemical characteristics for spill control methods and selection and use of minimum personal protective equipment. If onsite Malcolm Pirnie personnel are not able to contain the release, they must follow the procedures outlined for large releases.

In the event of a large release (greater than 55 gallons) of a hazardous substance:

- Respond in accordance to level of training and roles and duties assigned in the site-specific health and safety plan;
- Notify the HAZMAT/Spill response contractor in accordance with the site-specific health and safety plan;
- Notify the Malcolm Pirnie Director of Environmental Health & Safety at 1-800-478-6870 (24-hour emergency number).

16.4. Post Emergency Response Operations

Following a hazardous substance release, the removal of contaminated material (e.g., personal protective equipment, environmental media) will be conducted in accordance with 29 CFR 120(q)(11).

Waste determinations for materials contaminated by a release will be arranged by the Project Manager utilizing the regulations, laboratory analysis, MSDS, or manufacturer information. The PSO along with the Project Manager will conduct a hazard analysis to determine the risks and personal protective equipment requirements associated with handling and transporting the waste.

17.0 RECORDKEEPING

17.1. Waste Management Records

All required records and documents associated with hazardous waste management will be maintained by the Deputy Project Manager. These records include but are not limited to:

- Analytical results and chains of custody.
- Waste determinations.
- Training records of personnel.
- Inspection logs and inventories
- Manifests and shipping documentation.
- Exception reports and correspondence with federal state and local agencies.

The analytical results and waste determinations will be kept on file with the Project files for the firm's standard records retention period.

17.2. Training Records

Individual training certificates will be maintained in the local office Health and Safety files. The Director, Environmental Health and Safety, will maintain a copy of all corporate exposure control training records. A summary record will be maintained by Corporate Health & Safety in the PeopleSoft database, and will be updated according to the schedule established in the Health and Safety Training section of this manual.

The training records maintained in the local office file will include the following information:

- The dates of the training sessions.
- The contents or a summary of the training sessions.
- The names and qualifications of persons conducting the training.
- The names and job titles of persons attending the training sessions.

Training records shall be maintained for three years from the date on which the training occurred. Upon request, employees will have access to any of his/her training records maintained by the local office, the Director, Environmental Health and Safety, and Human Resources.

17.3. Medical Records

Malcolm Pirnie's Corporate Health & Safety group maintains employee medical records according to 29 CFR 1910.1020. Health Resources, Inc., Woburn, MA is the Corporate Medical Consultant and maintains these records at their facility. For the purposes of this Hazardous Waste Management Plan, employee medical records include:

- The name and social security number of the employee.
- A copy of results of examinations, medical testing, and follow-up procedures.
- Malcolm Pirnie's copy of the healthcare professional's written opinion.
- A copy of the information provided to the healthcare professional.

Attachment 6

Malcolm Pirnie, Inc. Personal Protection Equipment

TABLE OF CONTENTS

	<u>PAGE</u>
1.0 INTRODUCTION.....	1
2.0 POLICY	1
3.0 RESPONSIBILITIES	2
3.1. NON-HAZARDOUS WASTE PROJECTS	2
3.2. HAZARDOUS WASTE PROJECTS	2
4.0 HAZARD ASSESSMENT	4
5.0 PPE SELECTION.....	4
6.0 PPE USE	5
6.1. FITTING PPE	5
6.2. DAMAGED PPE.....	6
6.3. EMPLOYEE-OWNED PPE	6
7.0 IN-USE PPE MONITORING	6
8.0 PPE INSPECTION	6
9.0 PPE DECONTAMINATION.....	7
9.1. THE DECONTAMINATION PLAN	7
9.2. DECONTAMINATION PROCEDURES AND EQUIPMENT	8
10.0 PPE DISPOSAL	8
11.0 TRAINING	9
11.1. INITIAL TRAINING	9
11.2. ADDITIONAL TRAINING	10
12.0 RECORDKEEPING.....	10

APPENDICES

APPENDIX A - PRELIMINARY HAZARD ASSESSMENT CHECKLIST

APPENDIX B - PPE SPECIFICATIONS, CAPABILITIES AND LIMITATIONS

APPENDIX C - PPE ENSEMBLES FOR HAZARDOUS WASTE OPERATIONS
Levels of Protection for Levels A - D

**APPENDIX D - AIRBORNE CONTAMINANT ACTION LEVELS FOR
SELECTION OF PPE ENSEMBLES**

**APPENDIX E- MINIMUM AND MAXIMUM DECONTAMINATION STATIONS AND
EQUIPMENT FOR PPE ENSEMBLE LEVELS B AND C**

1.0 INTRODUCTION

The purpose of this section is to assist employees in the proper selection and use of personal protective equipment (PPE). Malcolm Pirnie staff shall use PPE when engaged in activities where there is a potential for exposure to chemical, biological, physical or mechanical hazards, or as otherwise required by applicable laws and regulations.

The occupational use of PPE is governed by a series of standards promulgated by the Occupational Safety and Health Administration (OSHA) and found in Title 29 CFR 1910, Subpart I, *Personal Protective Equipment*. These include 29 CFR 1910.133, *Eye and Face Protection*; 29 CFR 1910.135, *Occupational Head Protection*; and, 29 CFR 1910.136, *Occupational Foot Protection*. PPE required by the OSHA *Respiratory Protection Standard*, 29 CFR 1910.134, and the *Noise Standard* including the *Hearing Conservation Amendment*, 29 CFR 1910.95, are addressed separately in this Manual.

The OSHA standards dealing with personal protective equipment consist of three types of requirements. Section 1910.132 is a set of general requirements covering all types of equipment and all situations where it is needed. Section 1910.132 requirements do not cover section 1910.134, *Respiratory Protection*, or section 1910.137, *Electrical Protective Devices*, which are subjects of separate rule making. The other sections of Subpart I each give requirements for one particular type of equipment; and certain paragraphs in standards not primarily concerned with PPE call for protective equipment to be used under working conditions regulated by that section. In deciding on protective equipment for a project, project managers may find that provisions of all three apply.

OSHA does not recommend PPE if administrative or engineering controls will eliminate a hazard. Such controls are always preferred over reliance on personal protection to shield an employee from chemicals, processes or machinery known to be dangerous.

2.0 POLICY

A written hazard evaluation will be conducted for all Malcolm Pirnie worksites, **on all field projects**, other than work in office environments, to:

- Determine potential hazards to the health and safety of Malcolm Pirnie.
- Evaluate the need for and the feasibility of engineering and/or administrative controls of the hazards.
- Specify effective types of personal protective equipment to reduce potential exposures.

Individual articles of a PPE ensemble will be chosen by a qualified employee, Project Safety Officer (PSO) or Corporate Health & Safety, to provide the best available protection against known or reasonably anticipated chemical and physical hazards.

PERSONAL PROTECTION EQUIPMENT

Individual articles of a PPE ensemble will be sized to fit the individual wearing it.

Compromised PPE will not be worn by Malcolm Pirnie employees or employees of Malcolm Pirnie subcontractors.

Contaminated PPE materials will be left at the work site if this can be done in a **responsible** manner.

3.0 RESPONSIBILITIES

OSHA requires that Malcolm Pirnie initiate engineering and work practice controls, to the extent feasible, to minimize the potential for employee exposure to chemical, biological, physical, or mechanical hazards. If recognized health and safety hazards cannot be practically removed from the work environment, and if employee exposures cannot be significantly reduced by administrative means, Malcolm Pirnie must provide employees with appropriate PPE and ensure that it is used properly.

3.1. Non-Hazardous Waste Projects

Project Managers: Project Managers are responsible for providing the project resources necessary to determine the appropriate level of PPE for employees working on their projects. To this end, Project Managers and/or PSOs will conduct a preliminary hazard assessment of the worksite and tasks to be performed and specify the appropriate PPE ensemble for each task and location. The Hazard Assessment Checklist, found in Appendix A, should be used to conduct the preliminary hazard assessment. Based upon the information generated in the assessment, and good safety practices, the Project Manager or the PSO can:

- Evaluate, design or purchase feasible engineering controls to isolate the hazard.
- Develop procedures and work practices to control the hazard.
- Evaluate and specify PPE required for the safe completion of the project.

3.2. Hazardous Waste Projects

For hazardous waste projects, a hazard analysis is conducted when developing a Site Safety Plan (SSP) for field activities. The SSP writer and reviewers evaluate the potential safety and health hazards posed by the project tasks. Then, in the SSP, they specify levels of protection, the specific PPE in each level, and action level ranges that govern the selection of each level.

Any questions regarding hazard evaluations should be addressed to the SBU Health & Safety Leader or to the Manager, Health & Safety, COR.

Qualified Employee: As a practical matter, the Project Manager is likely to delegate the task and hazard evaluation to a junior member of the project team who will often serve as the PSO. Evaluating hazards and selecting appropriate engineering, work practice and PPE control methods for a project is an important responsibility. To promote the effective completion of this task, the Project Manager will delegate this task to an individual who meets certain education and training qualifications. Employees are considered qualified to select PPE if they meet either of these criteria:

- The employee has received formal training in industrial hygiene or safety practices.
- The employee has received training in the selection, use, maintenance and limitations of PPE (e.g., 40-Hour Hazardous Waste Operations, Construction Site Safety training, or PPE Training), is familiar with the site, the tasks to be completed and the known or reasonably anticipated site and task hazards.

Project Safety Officer: The Project Safety Officer (PSO) on hazardous waste projects has the responsibility and authority to see that the provisions of the approved SSP are implemented during site activities. The person selected to be PSO must meet the minimum qualifications above.

At the site, the PSO evaluates air-monitoring data, work tasks and site conditions and then specifies a pre-approved level of protection PPE ensemble to be used by Malcolm Pirnie employees. If site conditions change, the PSO may only upgrade or downgrade the level of protection in accordance with the action levels and PPE ensembles specified in the approved SSP. Modifications to the PPE ensembles, the task evaluations or the action levels as a result of unforeseen circumstances must be approved by the SBU Health & Safety Leader (HSL) and/or the Manager, Health & Safety, COR.

Equipment Coordinators: The office Equipment Coordinator (E.C.) is responsible for procuring and dispensing expendable PPE for that office.

Employees: Employees are responsible for using the PPE in accordance with both the training they receive, and instructions provided. Employees should alert the PSO or team leader if proper PPE has not been assigned, if they have not been trained in the use and limitations of assigned PPE, and if the PPE is damaged, compromised, or does not appear to be working.

4.0 HAZARD ASSESSMENT

Malcolm Pirnie prepares written hazard assessments in order to identify the appropriate PPE ensemble(s) for project work activities. The PPE ensemble(s) for hazardous waste projects are specified in the SSP. A particular ensemble is chosen based upon:

- Proposed work tasks.
- Potential routes of entry and points of contact.
- Airborne contaminant action levels specified in the SSP.

For projects that do not require a SSP, the Preliminary Hazard Assessment form (Appendix A) is used to develop PPE requirements. The written Hazard Assessment form provides the certifier's name, signature, date(s), and identification of assessment documents. Contact the HSL or the Manager, Health & Safety, COR for further assistance.

When new processes are implemented or when existing processes change, the PSO should be notified by the project staff so that the existing Hazard Assessment may be reviewed and updated as necessary.

5.0 PPE SELECTION

On projects defined by OSHA's *Hazardous Waste Operations and Emergency Response* standard (29 CFR 1910.120), and on other projects as determined by the hazard assessment, PPE ensembles (Levels of Protection) are selected based upon:

- The toxic materials, physical agents, or waste contaminants known to be present.
- Contaminant concentrations in the waste media.
- The toxicology and the probable routes of entry into the body exhibited by the contaminants.
- Known or expected airborne contaminant concentrations.
- Potential for exposure to physical agents (e.g., electrical, mechanical, hydraulic, pneumatic, chemical, thermal, nuclear, or non-ionizing radiation energy) based upon the type and strength of the energy source and the proximity of the employee to the source.

Individual articles of a PPE ensemble are chosen by a "qualified employee" (previously defined) to provide the best available protection against known or reasonably anticipated chemical and physical hazards. Multiple articles of PPE may be "layered" to provide multi-contaminant and full protection. The various elements of PPE will only protect a worker if the following conditions are met:

- The individual article of PPE must be effective against the hazard (see Appendix B).
- The individual article of PPE must be sized, fitted, worn and secured correctly.

- The functioning surface of the PPE must be intact and not compromised by holes, rips, tears, or split seams.
- The PPE ensemble (see Appendix C) chosen must be effective against all the hazards in the specific situation.

Non-specific action levels have been developed by the U.S. EPA and others as guidelines for determining respiratory and other PPE requirements when exposure air monitoring is conducted by non-specific response field instrumentation. Specific action levels may be used when a site is well characterized, the type and relative concentrations of air contaminants are well known, and appropriate field instrumentation is used to provide real-time exposure data. Malcolm Pirnie has adopted both sets of action levels. These can be found in Appendix C and in the current Malcolm Pirnie Short Form Site Safety Plan form. Airborne Contaminant Action Levels for Selection of PPE Ensembles is provided in Appendix D.

6.0 PPE USE

Individual articles of a PPE ensemble will be sized to fit the individual wearing it. To provide effective protection during removal and decontamination, PPE will be donned in the reverse order presented in the appropriate decontamination table. Duct tape will be used to seal overlaps between gloves /boots and the protective clothing, and to reinforce weak seams or tighten the waist of the garment. PPE will be cleaned and maintained in accordance with manufacturer specifications.

6.1. Fitting PPE

Proper fit of PPE is critical to providing adequate protection. Proper fit is also associated with comfort and comfort is essential if the employees are to wear the PPE provided. Malcolm Pirnie provides employees with a choice of PPE from several different vendors in a selection of sizes. In training, Malcolm Pirnie discusses and practices proper fitting, use and wear of the PPE.

OSHA believes fit is a critical factor in the overall effectiveness of PPE. PPE that fits poorly will not afford the necessary protection. PPE that is too small will bind and tear; PPE that is too large is harder to manage and can become tangled in equipment presenting additional hazards. Care should be taken to ensure the right size is selected. The user should be fit with the protective device and given instructions on care and use of the PPE. It is very important that employees be made aware of all warning labels for, and limitations of, their PPE.

Adjustment of the PPE should be made on an individual basis, with the goal of achieving a comfortable fit that will maintain the protective device in the proper position. Particular care should be taken in fitting devices for eye protection used against dust and chemical splashes, to ensure that the devices are sealed to the face. In addition, proper

PERSONAL PROTECTION EQUIPMENT

fitting of helmets is important to ensure that no helmet will fall off during work operations. When manufacturer's instructions are available, they should be followed carefully.

6.2. Damaged PPE

Compromised PPE will not be worn by Malcolm Pirnie employees. When a PPE wearer or their buddy notices that an article of PPE has been compromised, the two will quickly move to the decontamination/support zone to replace or repair the defective article(s).

6.3. Employee-Owned PPE

Malcolm Pirnie provides all required PPE at no or little cost to its employees. When employees plan to use personally owned PPE, the employee must present it to the PSO for inspection prior to use at the work site. If the PSO finds that the employee-owned PPE is adequate and has been properly maintained, the employee may use their personal PPE.

7.0 IN-USE PPE MONITORING

When wearing PPE at sites, Malcolm Pirnie personnel shall report any perceived problems or difficulties to the PSO. Likely concerns are:

- Perception of odors while wearing APR/SAR.
- Skin, eye, or nasal irritation.
- Unusual residues on PPE.
- Suspected degradation of PPE ensemble.
- Excessive discomfort or fatigue.
- Sudden increases in breathing resistance.
- Personal responses such as rapid pulse, nausea, and chest pain.

Should personnel experience any of these problems while wearing PPE, the PSO will temporarily shut down both Malcolm Pirnie and subcontractors operations on the site and all personnel will move to the support zone until the cause of the problem is identified and corrected.

8.0 PPE INSPECTION

PPE shall be inspected by employees before donning and periodically while in use. Protective clothing should be visually inspected before its use for imperfect seams, uneven coatings, tears, and malfunctioning closures. Gloves should be checked for pinholes by entrapping air in the glove, then rolling the cuff toward the fingers, or by inflating the glove and holding it under water. In either case, no air should escape. If a defect is observed in

PERSONAL PROTECTION EQUIPMENT

protective clothing or in gloves, the defective item should not be worn onsite. Clean defective apparel shall be disposed of in the trash. Contaminated defective apparel shall be left on-site in appropriate containers if possible.

During field activities, protective clothing should be periodically inspected by the employee and his/her assigned buddy for rips and punctures. Small rips or punctures observed in

garments may be taped over, or the garment may be exchanged for a new one. Large rips or punctures require exchange.

9.0 PPE DECONTAMINATION

Any site where hazardous waste operations occur must have a written plan that outlines decontamination procedures (see 29 CFR 1910.120 [k]). Employees must be trained on these procedures and the decontamination line must be operational when anyone enters areas on-site where there is suspected contamination.

9.1. The Decontamination Plan

The written decontamination plan addresses:

- The number and placement of decontamination stations.
- Decontamination equipment and methods.
- Methods for disposing of clothing and equipment that may not be completely decontaminated.
- Methods of cleaning decon equipment and disposing of decon wastes.

The decontamination plan shall be based on the assumption that all equipment and personnel leaving the Exclusion Zone ("hot zone") will be grossly contaminated. A personnel decontamination system will be established to wash and rinse (at least once) all reusable PPE worn in contaminated areas. This should be done in combination with a sequential doffing of protective equipment, starting at the first decontamination station with the most heavily contaminated item and progressing to the last decontamination station with the least contaminated article.

The decontamination plan developed should address the following factors:

- ***Type of Contaminant.*** The extent of personnel decontamination is a function of the amount of the contaminant, its toxicity and its interaction with the PPE articles.
-

PERSONAL PROTECTION EQUIPMENT

- ***Amount of Contamination.*** Gross contamination increases the probability of personal contact or the degradation and permeation. Swipe tests may help determine the type and quantity of surface contaminants, or clear articles for disposal as non-hazardous trash.
- ***Type and Level of PPE.*** Clothing variations and different levels of protection may require adding or deleting stations to the decontamination line.
- ***Work Function.*** Those who are performing tasks that will not bring them into contact with contaminants may not need to have their garments washed and rinsed while others in the Exclusion Zone, with potential direct contact with the hazardous material, will require a more thorough decontamination.
- ***Location of the Contamination.*** Contamination on the upper areas of protective clothing poses a greater risk to workers because volatile compounds may generate a hazardous breathing concentration for both the worker and the decontamination personnel. There is also an increased probability of skin contact when doffing the upper part of the clothing.

9.2. Decontamination Procedures and Equipment

Decontamination activities should be confined to a designed area within the Contamination Reduction Zone, known as the Contamination Reduction Corridor. The Corridor controls access into and out of the Exclusion Zone and confines decontamination activities to a limited area. The size of the Corridor varies depending on the number of stations in the decontamination procedure, overall dimensions of the work control zones, and the amount of space available at the site. On smaller sites or sites with limited contamination potential, the size of the decontamination area and the number of decontamination stations will be severely reduced.

Within the Corridor, distinct areas should be set aside for decontamination of personnel, portable field equipment, discarded clothing, etc. Step-by-step procedures for decontamination of personnel wearing PPE Levels B and C are found in Appendix E at the end of this section.

10.0 PPE DISPOSAL

There are few reference guidelines for disposal of contaminated or used PPE garments. Sites requiring Decontamination Corridors will also be equipped to drum, bag, or otherwise dispose of large volumes of PPE wastes generated by site operations. On smaller sites such as well drilling and sampling, or soils sampling projects, field teams are required to bring an adequate supply of heavy gauge opaque plastic garbage bags to hold disposable PPE garments after use.

Contaminated PPE materials will be left at the work site if this can be done in a **responsible** manner. This activity **must** be negotiated with the client / owner / operator / subcontractor in advance of the fieldwork. If this cannot be done, decontaminate contaminated PPE, conduct a swipe test on a representative sample, and bring it back, in clean plastic bags, to the office. PPE that is used but "clean" or was contaminated but tests "clean" may be disposed of in the office dumpster. PPE, which cannot be decontaminated or is contaminated by materials containing mercury, lead, solvents, petroleum, PCBs or dioxin, will be disposed of as hazardous waste.

11.0 TRAINING

Malcolm Pirnie personnel provided with PPE shall be trained in its use, care, capabilities, and limitations prior to using it in a hazardous work environment. Personnel engaged in hazardous waste operations site activities shall receive the initial 40-hour training, of which PPE instruction is an integral part. Subsequent refresher training will include an annual review in the use, limitations, inspection, and care of PPE. A combined refresher/PPE certificate will be issued documenting this training.

11.1. Initial Training

Initial training is provided to all employees that are required to wear PPE. Employees receive initial training in the proper use and care of PPE prior to wearing the PPE in the work place. This training is most effective when the employee understands the hazards that are present, how the PPE provides protection, and the limitations of the PPE.

At a minimum, the training portion of the PPE program should delineate the user's responsibilities utilizing both classroom and hands-on training when necessary to explain the following:

- When PPE is necessary to be worn.
- What PPE is necessary and the selection criteria used for this determination.
- The operation of the selected PPE, including capabilities and limitations.
- The nature of the hazards and the consequences of not using the PPE.
- The human factors influencing PPE performance.
- Instruction in inspecting, donning, doffing, checking, fitting, and using PPE.
- The user's responsibility for decontamination, cleaning, maintenance and repair of PPE.
- Limitations of the PPE.
- Useful life and disposal of the PPE.
- How to recognize emergencies.
- Emergency procedures and self-rescue in the event of PPE failure.
- The buddy system.
-

PERSONAL PROTECTION EQUIPMENT

- Emergency action planning, and the user's responsibilities and duties in an emergency.

Employees are required to demonstrate their understanding in each of the subject areas listed above. Special emphasis should be placed on proper wear, fit, and limitations of the PPE. If the employee cannot demonstrate a full understanding of the material provided in the training, that employee shall be retrained and must exhibit complete understanding of the material presented before they are allowed to wear the PPE in the work place.

11.2. Additional Training

Refresher training is provided when an employee cannot demonstrate a good understanding of the five required OSHA training topics (see above). Employees that are observed using PPE improperly are retrained.

Additional training is provided whenever processes change and new hazards require the use of additional or different PPE.

Staff provided with ancillary PPE (e.g., safety belts, floatation gear) should be trained in its use and care by the PSO before actual use onsite.

Staff requesting PPE who are not in the hazardous waste Health and Safety Training Program and have not received PPE training should be trained in the use and care of the PPE by their PSO before actual use onsite. The PSO will provide the Administrator, Health and Safety, WHI, with an attendance list and a brief summary of the training material covered to document the training and to issue certificates.

Since PPE use often causes discomfort and inconvenience, there is a natural resistance toward wearing it conscientiously. The major thrust of training must be to make the user aware of the need for PPE and to instill the motivation to properly wear and maintain the necessary PPE.

12.0 RECORDKEEPING

PPE training should be documented in the site health and safety logbook. The Manager, Health and Safety, COR, will maintain a copy of all corporate PPE training records. A summary record will be maintained by Health and Safety, COR, in the PeopleSoft database, and will be updated according to the schedule established in the Health and Safety Training section of this manual.

The training records maintained in the local office file will include the following information:

PERSONAL PROTECTION EQUIPMENT

- The dates of the training sessions.
- The contents or a summary of the training sessions.
- The names and qualifications of persons conducting the training.
- The names and job titles of persons attending the training sessions.

Training records shall be maintained for three years from the date on which the training occurred. Upon request, employees will have access to any of his/her training records maintained by the local office, the Manager, Health and Safety, COR.

APPENDIX A

PRELIMINARY HAZARD ASSESSMENT CHECKLIST

PART A	
TASK(S)	
WORK AREA(S)	
PART B	
HEAD PROTECTION	
<i>Hazards/Operations</i>	<i>PPE/Options</i>
<input type="checkbox"/> Construction	<input type="checkbox"/> Hard Hat
<input type="checkbox"/> Cold Weather	ANSI Z89.1-1986
<input type="checkbox"/> Confined Space	Class A and B
<input type="checkbox"/> Electrical	<input type="checkbox"/> Chin Strap
<input type="checkbox"/> Frequent Bending or Leaning	<input type="checkbox"/> Liner
<input type="checkbox"/> Heavy Equipment	<input type="checkbox"/> Hood
<input type="checkbox"/> Hot Weather	<input type="checkbox"/> Protective Hair Covering
<input type="checkbox"/> Low Ceilings/Piping	<input type="checkbox"/> Bump Cap
<input type="checkbox"/> Moving Machinery	
<input type="checkbox"/> Overhead Activity	
PROTECTIVE BODY CLOTHING	
<i>Hazards/Operations</i>	<i>PPE/Options</i>
<input type="checkbox"/> Chemical Transfer	<input type="checkbox"/> Fully Encapsulating Suit
<input type="checkbox"/> Cold Weather	<input type="checkbox"/> Non-Encapsulating Suit
<input type="checkbox"/> Confined Space	<input type="checkbox"/> Aprons, Leggings, and Sleeve Protectors
<input type="checkbox"/> Dirty Area	<input type="checkbox"/> Anti-Radiation Suit
<input type="checkbox"/> Fire Potential	<input type="checkbox"/> Flotation Gear
<input type="checkbox"/> Hot Weather	<input type="checkbox"/> Cooling Garment
<input type="checkbox"/> Laboratory	<input type="checkbox"/> Tyvek
<input type="checkbox"/> Sampling	<input type="checkbox"/> Warm Weather Clothing (Carhartt's, etc.)
<input type="checkbox"/> Wet Area	<input type="checkbox"/> Rain Gear
EYE PROTECTION	
<i>Hazards/Operations</i>	<i>PPE/Options</i>
<input type="checkbox"/> Acids/Caustics	<input type="checkbox"/> Safety Glasses with Side Shields
<input type="checkbox"/> Chemical Splashes	<input type="checkbox"/> Goggles
<input type="checkbox"/> Chemical Transfer	<input type="checkbox"/> Face Shields
<input type="checkbox"/> Confined Space	<input type="checkbox"/> Optical Inserts for Full Face Respirators
<input type="checkbox"/> Construction	
<input type="checkbox"/> Flying Particles	
<input type="checkbox"/> Gases and Vapors	
<input type="checkbox"/> Light (UV, Laser)	

PERSONAL PROTECTIVE EQUIPMENT

<input type="checkbox"/> Liquid Chemicals	
<input type="checkbox"/> Liquid Sampling	
<input type="checkbox"/> Molten Metal	
<input type="checkbox"/> Scraping	
<input type="checkbox"/> Waste Water/Sludge	
<input type="checkbox"/> Wire Wheel/Chipping	

HAND PROTECTION

<i>Hazards/Operations</i>	<i>PPE/Options</i>
<input type="checkbox"/> Acids/Caustics	<input type="checkbox"/> Gloves to Match Hazard(s)
<input type="checkbox"/> Chemical Transfer	<input type="checkbox"/> Inner linings
<input type="checkbox"/> Confined Space	<input type="checkbox"/> Mittens
<input type="checkbox"/> Cold Weather	<input type="checkbox"/> A combination of gloves, liners and mittens may be best
<input type="checkbox"/> Construction	
<input type="checkbox"/> Cutting Snips	
<input type="checkbox"/> Hammering	
<input type="checkbox"/> Hazardous Waste	
<input type="checkbox"/> Hot Surfaces	
<input type="checkbox"/> Laboratory	
<input type="checkbox"/> Liquid Chemicals	
<input type="checkbox"/> Pinch Points	
<input type="checkbox"/> Rough or Sharp Objects	
<input type="checkbox"/> Sample Handling	
<input type="checkbox"/> Sampling	
<input type="checkbox"/> Shoveling	
<input type="checkbox"/> Waste Water/Sludge	

FOOT PROTECTION

<i>Hazards/Operations</i>	<i>PPE/Options</i>
<input type="checkbox"/> Biological Decay	<input type="checkbox"/> Work Shoes
<input type="checkbox"/> Broken Ground	<input type="checkbox"/> Safety Shoes
<input type="checkbox"/> Confined Space	<input type="checkbox"/> Overboots
<input type="checkbox"/> Cold Weather	<input type="checkbox"/> Waders
<input type="checkbox"/> Construction	<input type="checkbox"/> Hip Boots
<input type="checkbox"/> Demolition	<input type="checkbox"/> A combination of foot protectors may be best
<input type="checkbox"/> Dirty Area	
<input type="checkbox"/> Drum Movement	
<input type="checkbox"/> Electrical Hazards	
<input type="checkbox"/> Falling or Rolling Objects	
<input type="checkbox"/> Heavy Equipment	
<input type="checkbox"/> Inclement Weather	
<input type="checkbox"/> Laboratory	
<input type="checkbox"/> Moving Machinery	
<input type="checkbox"/> Shallow Water (to 2 Feet)	
<input type="checkbox"/> Shallow Water (to 4 Feet)	
<input type="checkbox"/> Waste Water/Sludge	
<input type="checkbox"/> Wet Soil	
<input type="checkbox"/> Uneven Ground	

FALL PROTECTION

<i>Hazards/Operations</i>	<i>PPE/Options</i>
<input type="checkbox"/> Confined Space	<input type="checkbox"/> Full Body Harness w/Shock-absorbing Lanyard

PERSONAL PROTECTIVE EQUIPMENT

<input type="checkbox"/> Floor Openings (Above 6') <input type="checkbox"/> Ladders (Above 28') <input type="checkbox"/> Platforms (Above 6') <input type="checkbox"/> Roofs <input type="checkbox"/> Scaffolds	<input type="checkbox"/> Retractable Life Line <input type="checkbox"/> Safety Line and Rope Grab
---	--

RESPIRATORY PROTECTION	
<i>Potential Hazards/Operations</i>	<i>PPE/Options</i>
<input type="checkbox"/> Acids/Caustics	<input type="checkbox"/> Half Face Air Purifying Respirator
<input type="checkbox"/> Chemical Transfer	<input type="checkbox"/> Full Face Air Purifying Respirator
<input type="checkbox"/> Confined Space	<input type="checkbox"/> Self Contained Breathing Apparatus (SCBA)
<input type="checkbox"/> Dusts and Mists	
<input type="checkbox"/> Gases and Vapors	
<input type="checkbox"/> Hazardous Waste	
<input type="checkbox"/> Laboratory	
<input type="checkbox"/> Liquid Chemicals	
<input type="checkbox"/> Sample Handling	
<input type="checkbox"/> Sampling	
<input type="checkbox"/> Waste Water/Sludge	

Respiratory Protection Addendum--Partial List of Available Cartridges:

Multi-Gas/Vapor Super Cartridge Organic Vapors Cartridge Cartridge Organic Vapors/Acid Gases Cartridge Acid Gases Cartridge Cartridge/P100 Filter Cartridge Formaldehyde Cartridge Cartridge Organic Vapors Cartridge/P100 Filter Cartridge N95 Filter/Prefilter	P100 Filter Cartridge Multi-Gas/Vapor Super Cartridge/P100 Filter Acid Gases Cartridge/P100 Filter Cartridge Organic Vapors Cartridge/Acid Gases Ammonia/Methylamine Cartridge Ammonia/Methylamine Cartridge/P100 Filter
---	---

Hearing Protection Addendum--Available Hearing Protection

Ear Plugs, Many Types and Styles
Ear Muffs
Combination of Ear Muffs and Plugs

Evaluator: _____ **Date:** _____

Department Head: _____ **Date:** _____

APPENDIX B

PPE SPECIFICATIONS, CAPABILITIES AND LIMITATIONS

- Introduction
- Protective Clothing
- Types of Protective Clothing
- Head Protection
- Eye and Face Protection
- Hearing Protection
- Hand Protection
- Foot Protection
- Ancillary PPE
- Reference

PPE SPECIFICATIONS, CAPABILITIES AND LIMITATIONS**1) INTRODUCTION**

This appendix provides information on the technical specifications, capabilities and limitations of various types of PPE typically used by Malcolm Pirnie employees. This information is by no means exhaustive and may become rapidly dated by new research findings and product development. If you have any questions regarding the applicability of a particular piece of PPE, contact your SBU Health and Safety Leader or the Manager, Health and Safety, COR.

2) PROTECTIVE CLOTHING

Protective clothing is a type of PPE that provides protection against dermal contact with dirt, hazardous chemicals or waste. Protective clothing is made of various fabrics and fabric treatments, which impart the desired physical and chemical resistive properties. Protective clothing may be limited-use or repetitive use and is usually worn over street clothes, underwear, or bathing suits.

Protective clothing has two critical components: the fabric and the tailoring. The fabric imparts the physical and chemical properties of the garment. Fabric manufacturers conduct tests using American Society of Testing Materials (ASTM), American National Standards Institute (ANSI), and National Fire Protection Association (NFPA) protocols to determine and rate the protective characteristics of their products.

Protective fabrics are sold to safety clothing manufacturers who produce the final garment. The manufacturer's design or manufacturing (tailoring) processes may make superior protective clothing; or garments entirely unsuitable for their intended use. Common failure points are the seams, stitching and the zippers. Chemicals, which may not be able to permeate through the fabric, may easily pass through split seams, stitch holes or zipper teeth. Seams should be sewn, heat-sealed or taped.

a) Selection Criteria

Protective clothing shall be selected to protect employees from occupational hazards while considering the hazards presented by the garments themselves. When selecting protective clothing;

- Consider the hazardous chemicals present, the task(s) to be performed, and the ambient site conditions.
- Match the physical and chemical resistance characteristics of the garment against the requirements and limitations of the site and task-specific conditions.

- Choose the garment with the widest range of protection for a site that has a variety of chemical hazards.

Multiple layers of protection may be needed when more than one contaminant is present or when the hazards are unknown. Disposable boots, gloves, and splash suits are used to provide an extra layer of protection.

Evaluate the physical performance characteristics of each garment under consideration. These performance characteristics may increase the hazards associated with using the garment. The cost of certain types of protective clothing and the affect of the clothing on employee productivity are secondary but valid concerns.

b) Performance Characteristics

Heat Transfer - A garment with a low rate of heat transfer increases heat stress of the person wearing it.

Durability - is the degree to which the protective clothing resists tears, punctures, abrasions, and repeated decontamination.

Flexibility - The garment should be flexible to allow mobility.

Temperature effects - The garment should be able to maintain its protective integrity and flexibility in the temperature ranges expected at the work site.

Decontamination - If reusable protective clothing cannot be decontaminated easily, use a disposable garment with the same resistive properties.

Compatibility - The selected garment should not make it difficult or impossible to use other required protective equipment (e.g., a hard hat).

Lifetime - Lifetime is determined by the length of time a reusable garment can resist aging, especially under severe conditions.

Protective clothing comes in various sizes. The larger sizes (large, XL or XXL) are preferable during cold weather because they allow the garment to be worn over layered winter clothing. Pay particular attention to project team members who have special sizing requirements.

While protective clothing is useful to protect personal clothing from becoming soiled, there may be hazards involved in using protective garments. Therefore, using unnecessary PPE is discouraged.

The project or task evaluation in Appendix A, EPA's *Guidelines for the Selection of Chemical Protective Clothing* (Ref. 1), the *Quick Selection Guide to Chemical Protective Clothing* (Ref. 2), are useful in selecting appropriate protective clothing.

3) TYPES OF PROTECTIVE CLOTHING

a) Repetitive-Use Rainwear / Splash Protection

Rainwear garments are used alone or in combination with chemical protective clothing to prevent exposure to inclement weather and incidental mud or chemical splashes. When choosing these garments consider:

- Whether the garment will be subject to limited use or continuous exposure.
- What will be the specific physical or chemical hazards?
- What are the flexibility and thermal requirements?

b) Available Materials:

Vinyl - extremely lightweight PVC material that offers a reasonable initial barrier to liquid penetration. Good flexibility through changing temperatures. Best for short-term use with water-based liquids, mild acids, solvents, oils and salts.

PVC-Coated Fabrics - a broad class of synthetic thermoplastic polymers that protects against many liquids and chemicals. The degree of protection varies depending upon the specific formulation and the thickness of the coating. Resists salts, alkalies, oils, ketones, aldehydes, alcohols, some acids and organic esters.

Rubber-Coated Fabrics - A very flexible heavy fabric for heavy-duty use in extreme cold or heat. Abrasion and tear resistant and offers general protection against solvents and chemicals.

Neoprene-Coated Fabrics - A very flexible heavy fabric for heavy-duty use in extreme cold or heat. Abrasion and tear resistant and offers general protection against acids, hydrocarbons and oils.

Nitrile-Coated Fabrics - Thin-gauge material resistant to cuts and punctures. Resistant to grease, acids and solvents.

Polyurethane-Coated Fabrics - Light weight and sheds liquids easily. Breath ability depends upon thickness of coating and material additives. Good abrasion resistance. General protection against many liquids.

c) Laboratory Wear

Lab coats or splash aprons are required when using chemicals in a laboratory setting. Lab coats will be of cotton or cotton/polyester blend, have long sleeves and extend to the knee. Standard lab coats are not especially fire resistive nor do they provide protection against chemical splashes. Care should be exercised near open flames or hot surfaces. Splash aprons and over-sleeves made of the appropriate material (see Rainwear/Splash Protection) should be used in laboratory situations where chemical, sample or waste splashing is likely.

d) Limited-Use General Protection Clothing

Economical choice for protection against limited hazards such as lead and asbestos dusts, radionuclides, light chemical splashes and biohazards. When choosing these garments consider:

- Whether the garment will stand up to the rigors of the work environment.
- The degree of protection offered by the garment against the contaminants (and concentrations) present.
- What are the flexibility and thermal requirements?

e) Available Materials

Tyvek - registered trademark of the E.I. DuPont Company. Tyvek is a spun-bonded olefin fiber, which delivers high tear resistance and a high level of protection against particulate materials. Available in a variety of styles and colors.

Kleenguard - registered trademark of the Kimberly-Clark Corporation. Kleenguard is a non-woven polypropylene fabric, usually layered, which effectively repels most non-hazardous liquids, oils and greases and but allows air to pass through reduce the potential for heat stress. Available in a variety of styles and colors.

f) Limited-Use Chemical Protective Clothing

Chemical Protective Clothing (CPC) is used prevent exposure to chemical contact or splashes. For protection from significant chemical or vapor hazards, choose garments that prevent hazardous liquid breakthrough for at least 240 minutes and prevent hazardous vapor breakthrough for at least 1440 minutes as tested by the ASTM F739 protocol. When choosing these garments consider:

4) HEAD PROTECTION

Head protection shall be worn when working in areas where there is danger of head injury from impacts, falling and flying objects, electrical shock and burns, and contact with hazardous chemicals.

Hard hats shall be worn on all construction sites, in the immediate vicinity of drilling operations, in industrial facilities where there are overhead activities, during confined space entry tasks, and in posted hardhat areas. Hardhat suspensions must always be in place, properly adjusted and free from defects. The hard hat selected shall be compatible with any other type of PPE in use including suits, respirators, face shields, and hearing protection.

a) Available Equipment

Hard Hats - hard hats that comply with ANSI Z89.1-1986, Class A and B, and are SEI certified, provide appropriate head protection from overhead impact and electrical hazards. Bump caps are not acceptable. Employees shall not deface, drill holes, or otherwise tamper with hard hats in any way that might compromise their effectiveness.

Chin Straps - employees shall use chin straps when tasks involve strenuous bending, downward movements or in any circumstance, for instance, confined space entry, that may result in the hard hat falling off the employee's head.

– Liners - Hardhat liners can be worn inside the hard hat to provide thermal protection during cold weather.

Hoods - hoods can be worn with hard hats, and are usually attached to a whole-body CPC. Hoods protect the head and neck from hazardous chemicals. Hoods can be used to protect the hair when wearing respirators.

Visitor's Hardhats - project offices and trailers should be equipped with an adequate number of spare hard hats for the use of visitors to the project site.

b) Inspection and Maintenance

Hardhats and suspensions systems will be inspected before each use. Cracking, signs of excessive wear, or frayed webbing is cause for replacement. Contact your Equipment Coordinator for parts or hardhat replacement.

2) EYE AND FACE PROTECTION

Appropriate eye and face protection shall be worn by employee when exposed to hazards from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or potentially injurious light radiation.

Employees shall use eye protection that provides side protection when there is a hazard from flying objects.

Employees who wear prescription lenses while engaged in operations involving eye hazards shall wear eye protection that incorporates the prescription in its design, or shall wear eye protection that can be worn over the prescription lenses without disturbing the proper position of the prescription lenses or the protective lenses.

Contact lens shall not be worn in the presence of particulate, chemical, or gaseous eye hazards.

Employees working near sources of injurious light radiation including welding arc, cutting flame, class III and IV lasers, etc., shall use equipment with filter lenses that have a shade number that will protect the eyes from injury.

a) Available Equipment

Safety Glasses with Side Shields - safety glasses with full side shields (prescription to 20/40 vision if required) complying with ANSI Z87.1-1989 shall be worn during drilling operations, and when working near impact tools or equipment. The glasses protect the eyes from large particles

Goggles - goggles complying with ANSI Z87.1-1989 are available in two types: chemical-splash (indirectly vented) and non-vented. Both are available with polycarbonate lenses to protect the eyes from impact injury, chemical splashes, large particles, and projectiles. Non-vented goggles provide additional protection against vapors and gases. Goggles may be worn over prescription eyeglasses.

Face shields - face shields complying with ANSI Z87.1-1989 and at least 8" long protect the face and neck from chemical splashes but do not protect against projectiles. Face shields provide only limited eye protection. Goggles or safety glasses should be worn in conjunction with face shields. Face shields that attach directly to the hard hat are sealed to prevent overhead splashes from running down the inside of the face shield.

Full-face Respirators - because the lens of the full-face respirator is constructed of polycarbonate material meeting the impact resistance standards specified in 30 CFR 11, additional eye and face protection is not required when wearing a full-face respirator.

Optical Inserts - spectacle kits are provided by Malcolm Pirnie to users of full-face respiratory protection who wear corrective eye wear. Each eligible employee may take a spectacle kit to his or her personal eyewear provider to have prescription lens ground and fitted to the kit. The inserts should correct visual acuity to at least 20/40. Reasonable costs, excluding eye exams, are reimbursable as an group Health & Safety expense (Chart of Accounts 7931). The cost of associated eye examinations can be covered by VSP with

any balance submitted for reimbursement from your Flexible Spending Account (Medical).

b) Visitor's Safety Glasses

Project offices and trailers should be equipped with an adequate number of spare safety glasses and goggles for the use of visitors to the project site.

3) HEARING PROTECTION

Hearing protection shall be worn by employees who are exposed to noise levels in excess of those defined in OSHA standard 29 CFR 1910.95. See the Section on Hearing Conservation for additional information.

Two basic types of hearing protectors are available: ear plugs and earmuffs. The use of earplugs shall be considered with caution because earplugs can introduce chemical contaminants into the ear. The selection of hearing protectors shall be based on the attenuation requirements of 29 CFR 1910.95, and on the comfort of the wearer. Employees may require hearing protection when working near drilling and heavy equipment operations, high impact tools, or when working in the vicinity of generators, air compressors or other noisy machinery. Earmuffs are not a stock item since they need to be sized to the individual.

4) HAND PROTECTION

Employees shall use appropriate hand protection when exposed to hazards such as those from skin absorption of harmful substances; severe cuts and lacerations; severe abrasions; punctures; chemical burns; thermal burns; and harmful temperature extremes.

A qualified employee shall select gloves designed to provide protection against specific chemicals and physical demands of the site. Use flexibility, resistance to tearing and puncturing, and resistance to specific chemicals as criteria for selection.

If roughened-surface, chemical-resistant gloves are not available wear heavy leather gloves or disposable studded cotton gloves over chemical-resistant gloves to provide better gripping during manual labor.

Combinations or layers of chemical-resistant gloves are used to protect against multiple chemical contaminants. For example, a mixture of acids, caustics, and aromatic hydrocarbons may require the use of outer neoprene gloves for protection against acids and caustics, and inner PVA gloves for protection against the aromatics.

Disposable latex or vinyl (surgical) gloves are a general-purpose disposable inner glove and are routinely discarded after each use. Permeation-resistant outer gloves such as Viton and butyl rubber are selected based on the chemicals involved. Neoprene is a general-purpose

outer glove. Cotton liners are used inside chemical-resistant gloves to provide warmth during cold weather, or to absorb sweat during summer.

The qualified employee shall consider the glove's thickness and cuff length. Thick gloves with long cuffs (gauntlet type) provide more protection than thin, short gloves. However, the material should not be so thick that it interferes with the dexterity required by the task.

a) Available Materials

Natural Rubber (Polyisoprene). Resists degradation by alcohols and caustics. Not recommended for organics.

Butyl Rubber (Synthetic Rubber). Resists degradation by many contaminants including ketones and esters. Especially resistant to permeation by gases and water vapors. Not recommended for halogenated hydrocarbons and petroleum compounds.

Polyvinyl Alcohol (PVA). Resists degradation and permeation by aromatic and chlorinated hydrocarbons and petroleum compounds. Not recommended for water-based solutions, acids, bases, ethers and esters.

Neoprene (Chloroprene). Resists degradation by caustics acids, alcohols, and oils. Not recommended for halogenated and aromatic hydrocarbons, PCBs and ketones.

Nitrile (Acrylonitrile Polymers / Butadiene). Resists degradation by petroleum compounds, gasoline, alcohols, acids, caustics, and peroxides. Not recommended for aromatic or halogenated hydrocarbons, amines, ketones, and esters. Can be used for some chlorinated compounds.

Viton. Resists degradation and permeation by aromatic and chlorinated hydrocarbons and petroleum compounds, oxidizers, acids, and water-based solutions. Not recommended for aldehydes, esters, ketones, amines, and acetone.

Latex Surgical Vinyl (disposable). Poor chemical resistance. Not recommended as an outer glove. This type of glove rips and tears easily. Remember to remove large rings or rings with protrusions or sharp points to prevent tearing. Use only when dexterity and flexibility are needed in non-hazardous chemical situations.

Silver Shield. Resists degradation and permeation by aromatic and chlorinated hydrocarbons and petroleum compounds, oxidizers, acids, and most water-based solutions. Not recommended for amides.

5) FOOT PROTECTION

Footwear worn at field sites shall comply with the ANSI Z41-1991 and shall be chemically resistant. Proper footwear protects the foot from crushing, puncture, electrical, and chemical hazards.

a) Available Materials

Leather safety boots with steel toe and shank - resists punctures and crushing. Employees are responsible for purchasing their own boots and this expense may be reimbursed up to \$120.00 per year with their manager's approval. These boots are generally not chemical or water-resistant without the use of disposable latex/butyl/"Tyvek" boot covers or neoprene overboots.

Overboots - made of PVC, latex, butyl, natural rubber, polyethylene, neoprene or vinyl provide protection from a wide range of chemicals. Some overboots have an integrated steel toe and puncture resistant insert.

Waders - waders are one-piece waterproof garments with boots and coveralls that protect the lower body (up to the hip/chest) from water immersion. Employees sampling water from ponds, streams or sewers at locations that are no more than waist deep are to wear waders.

Hip boots - are useful for water sampling or sewer inspections when the water level is below the thighs. Hip boots are less expensive and provide more mobility than chest-high waders.

6) ANCILLARY PPE

Ancillary PPE is used for protection against specific health and safety hazards.

a) Available Equipment

Belts, Harnesses, Lanyards and Lifelines - body harnesses, lanyards, and lifelines are used to prevent falls from elevated areas or into water, and to make possible the emergency retrieval of employees who have entered confined spaces. Fall protection belts are no longer allowable. Employees working on or moving across unguarded platforms or catwalks at elevations **greater than 6 feet** are required to tie off to some type of effective fall protection.

Safety belts used at sites shall comply with 29 CFR 1926.104 and also shall be constructed of spark-free hardware and chemical-resistant materials. Lifelines and fall protection devices must use double-action snap hooks. Safety restraints are selected on the basis of applicability to the task(s) for which they will be used.

Cooling Vests - cooling vests are used to remove excess heat generated by worker activity, protective clothing, or extremely hot environments. The most commonly used units resemble vests with cold pack pockets, and are used when personnel are wearing level B or C protection in warm weather, usually above 80°F. To use the vests, ice-making equipment and cold pack storage must be available on-site. The availability of this equipment must be addressed in planning for the work.

Other cooling devices use forced air or circulation of a refrigerant through caps and vests. Maintenance problems and the increased weight (up to 25 pounds) borne by workers shall be evaluated when selecting these units.

Floatation Gear - floatation gear such as life jackets, work vests and cold water survival suites that meet United States Coast Guard (USGS) standards (46 CFR Part 160) shall be worn when working in or on surface waters e.g., ponds, lagoons, and streams, at chest high depths (four feet) or greater. Floatation gear is commonly worn over protective clothing. Floatation vests add bulk to the wearer and may restrict mobility. Floatation vests may be difficult to decontaminate.

Reflectorized Vests - reflectorized vests are to be worn by all employees when working near vehicular traffic and in situations where visibility is essential.

Tool Pouches and Belts - equipment pouches and belts may be worn by site personnel who use portable equipment and tools during field activities. Pouches and belts are worn around the waist, outside of the protective clothing.

Infection Control Kits - an infection control kit (ICK KIT) shall be available in each office, field office, field trailer, and field vehicle for use in the event of an injury resulting in contact with blood or other bodily fluids.

Protective Leggings - leggings are worn to protect against snakebites or other hazards to the lower extremities.

7) REFERENCES

- *EPA. Guidelines for the Selection of Chemical Protective Clothing. -1987.*
- *Forsberg, K. and S.Z. Mansdorf. Quick Selection Guide to Chemical Protective Clothing. Van Nostrum Reinhold, New York, 1989.*

APPENDIX C

PPE ENSEMBLES FOR HAZARDOUS WASTE OPERATIONS

Levels of Protection for Levels A - D

1) ENSEMBLES FOR HAZARDOUS WASTE OPERATIONS

Various types of personal protective clothing, respirators, and ancillary protective equipment are combined into ensembles that provide a sufficient level of protection from site-specific hazards. Using excessive levels of PPE is discouraged.

Four distinct levels -- A, B, C, and D -- have been defined by EPA, each providing protection against varying degrees of respiratory, dermal, and safety hazards. A specific level of protection shall be selected based on:

- The type, concentration, and toxicity of airborne contaminants.
- The potential for personal exposures, liquid splashes, or direct contact with hazardous materials in relation to site tasks /activities.

The main factor in selecting a level of protection is the magnitude of the respiratory and dermal hazards present or potentially present on-site. Levels A and B specify the same respiratory protection (self-contained or air-line breathing apparatus), but Level A includes specific dermal protection (fully encapsulating suit). Levels B and C generally specify the same dermal protection (chemical-resistant coveralls or partially encapsulating suit) but Level B includes a higher degree of respiratory protection. Level D, essentially an ordinary work uniform ensemble, is used only when there is minimal potential for exposure to hazardous materials or waste on-site.

Each standard level of protection may be modified in the Site Safety Plan (SSP) to account for varying degrees of respiratory and dermal hazard. For instance, a Level C ensemble may be modified for a task involving surface soil sampling for a semi-volatile compound in wet conditions by making the use of the respirator contingent upon air monitoring results but mandating full body protective clothing for dermal exposure control.

The SSP specifies the level of protection required for various site tasks and work zones. Upgrades or downgrades of protective levels are based on the action levels specified in the air-monitoring procedures of the SSP. An increase or decrease in the potential for exposure to hazardous materials necessitating a level of protection not specified in the SSP requires a written amendment to the SSP approved by the Project Safety Officer (PSO), the SBU Health and Safety Leader, and/or the Manager, Health and Safety, COR.

The four levels of protection that may be used by Malcolm Pirnie personnel are described below. Selection criteria are presented for general guidance only: protection shall be tailored to the site-specific contaminants and conditions.

a) *Level A Protection*

Level A shall be selected when the highest level of respiratory, skin, and eye protection is required due to the presence in the air of high concentrations of hazardous materials, or

the presence of contaminants highly toxic to the skin. Level A is also used when the hazards are unknown, inadequately defined, or when Level B protection is not adequate. Level A protection is extremely cumbersome and may be life-threatening due to heat stress. Level A is generally appropriate in emergency response and rescue circumstances not normally performed by Malcolm Pirnie personnel. For example, workers would use Level A protection when entering a confined area to repair a leaking chlorine gas valve.

Selection Criteria - Use Level A when:

- Hazardous materials have been identified on-site that require the highest level of respiratory, skin, and eye protection based on measured (or potentially) high concentrations of hazardous vapors, gases, or particulate atmospheres that are greater than levels determined to be "immediately dangerous to life or health" (IDLH).
- Site operations or tasks present a high potential for splashing of, contact with, or airborne exposure to substances highly toxic by skin absorption.
- Site operations or tasks to be conducted in confined or poorly ventilated areas where there is potential for encountering highly toxic substances.

Personal Protective Equipment at Level A consists of:

- Pressure-demand, full-face, self-contained breathing apparatus (SCBA) or a pressure-demand, supplied-air respirator / SCBA combination i.e., a dual-purpose breathing apparatus (DPBA).
- Fully encapsulating suit with intrinsic gloves, booties, and polycarbonate lens.
- Inner chemical-resistant gloves (latex or vinyl surgical type).
- Overboots of appropriate chemical - resistant materials with steel toe and shank. (The boots are worn over the intrinsic booties of the rubber suit, and the boots themselves may be covered by disposable booties.)

Additional Equipment that may be required for a Level A entry:

- Cooling vest/jacket
- Disposable chemical-resistant booties (latex/butyl)
- Coveralls
- Cotton long underwear
- Hard hat
- Hearing Protection
- Two-way radio communications (rated intrinsically safe)

b) Level B Protection

Level B shall be selected when the highest level of respiratory protection is required but a degree of dermal protection lower than that afforded by Level A is acceptable. The specific type of dermal protection may vary from site to site. A good quality, chemical-

resistant, one-piece garment with taped wrists, ankles, and hood often provides adequate dermal protection for splash or contact hazards on-site.

Level B is generally used in situations where respiratory hazards are difficult to evaluate. Level B protection is cumbersome and may cause heat stress. Level B protection shall be the minimum used during initial response or reconnaissance except when the respiratory hazard has been evaluated and it is determined that a lower level of respiratory protection is acceptable.

Selection Criteria: Use Level B when:

- The type and concentration of airborne contaminants have been identified as those requiring a high level of respiratory protection, but a lower level of skin protection, for example, when specific airborne substances, present in IDLH concentrations, do not present a severe skin contact/absorption hazard. Also when atmospheres do not meet the criteria that would permit use of air-purifying respirators.
- Atmospheres contain less than 19.5 percent oxygen.
- Site activities generate high concentrations of substances highly toxic by skin absorption but skin contact with toxic substances is not likely.
- When the air contaminants of concern do not have adequate warning properties of breakthrough or there are no approved filter cartridges for Level C respiratory protection.
- When significant time will be spent in areas with contaminant concentrations at or above occupational exposure limits.

Personal Protective Equipment at Level B consists of:

- Pressure-demand, full-face SCBA or DPBA.
- Chemical-resistant clothing, including disposable "Tyvek" coveralls, with or without various coatings. Also, butyl rubber aprons, or neoprene, acid-resistant, full body coveralls.
- Inner chemical-resistant gloves (latex or vinyl surgical type.)
- Outer chemical-resistant gloves (butyl, neoprene, Viton, or other appropriate material.)
- Neoprene rubber boots with steel toe and shank.
- Emergency escape bottle with 5 - 15-minute air supply.

Additional Equipment that may be required for a Level B entry:

- Cotton coveralls worn beneath CPC.
- Cotton long underwear.
- Disposable chemical-resistant booties (latex/butyl).
- Hard hat

- Hearing protection
- Two-way radio communications
- Cooling vest/jacket.

c) Level C Protection

Level C protection is composed of dermal protection and an air- purifying respirator (APR). Level C shall be used only when the types and concentrations of airborne substances are known, when the criteria for using APRs are met, and when skin exposure is unlikely.

Use of this level is limited by the restrictions placed on the use of APRs in 29 CFR 1910.134 and ANSI Z88.2-1992. Air contaminants shall be measured and compared to action levels specified in the SSP. Level C may be sufficiently cumbersome to cause heat stress.

Selection Criteria: Use Level C when:

- The type and concentration of airborne contaminants are known, an approved respirator cartridge/canister is available that will remove the contaminants, and the following criteria for use of APRs are met:
- Oxygen content is equal to or greater than 19.5 percent.
- Concentrations do not exceed the NIOSH-approved use levels for the respirator and cartridge/canister.
- Contaminants have obvious warning properties (e.g., contaminant can be detected by odor, taste, or irritation at concentrations below its exposure limit).
- Atmospheres are not IDLH.
- Airborne contaminants are known and will be monitored throughout site activities.

Site activities will not generate high airborne concentrations or liquid splashes or other means of contact with substances highly toxic to the skin.

Personal Protective Equipment at Level C consists of:

- Full-face APR or full-face powered APR with cart ridge/canister appropriate for the airborne contaminant present.
- Chemical-resistant clothing (same alternatives as for Level B, determined by site).
- Inner chemical-resistant gloves (latex or vinyl surgical type).
- Outer chemical-resistant gloves (butyl, neoprene, Viton, or other appropriate material).
- Work boot with neoprene rubber sole, and steel toe and shank.

Additional Equipment that may be required for a Level C entry:

- Coveralls.
- Disposable chemical-resistant latex or butyl booties.
- Cotton long underwear.
- Hardhat.
- Hearing protection.
- Two-way radio communications.

d) Level D Protection

A work uniform providing minimal protection constitutes Level D protection. Level D shall not be used in a hazardous atmosphere or environment. Level D will be used only when there is no indication of a hazardous atmosphere, and the work tasks preclude splashes, immersion, or other bodily contact with hazardous substances.

In situations where the possibility of a hazardous atmosphere exists, Level D is permissible when prescribed by the SSP as long as monitoring indicates the continued absence of a hazardous atmosphere. When hazardous atmospheres are detected, workers in Level D shall upgrade their protection in accordance with instructions in the SSP.

Selection Criteria: Use Level D on:

- Sites where the SSP writer and reviewer have made a reasonable determination that exposure to hazardous materials is unlikely.
- Sites where there is limited potential for exposure to hazardous materials, but procedures for monitoring onsite air and upgrading the protection level or evacuating the site have been established, and are being followed.

Personal Protective Equipment at Level D consists of:

- Coveralls (cotton or "Tyvek").
- Work boots with steel toe and shank.
- Safety glasses with side shields.

Additional Equipment that may be required for a Level D entry:

- Inner and outer gloves.
- Hardhat.
- Hearing protection.
- Emergency escape respirator (readily available onsite.)
- Air-purifying respirator (readily available onsite.)
- Aprons, boot covers.

APPENDIX D

**AIRBORNE CONTAMINANT ACTION LEVELS FOR
SELECTION OF PPE ENSEMBLES**

Appendix D Airborne Contaminant Action Levels for Selection of PPE Ensembles

Action Levels

<u>Uncharacterized Airborne Vapors or Gases</u>		<u>Characterized Gases, Vapors, Particulates**</u>
Level D Background*		Up to 50% of PEL, REL or TLV
Level C Up to 5 ppm above background		Up to 25 times PEL, REL or TLV
Level B 5 ppm to 500 ppm above background		UP to 500 times PEL, REL or TLV
Level A 500 ppm to 1000 ppm above background		Up to 1000 times PEL, REL or TLV
* Off-site "clean" air measurement.		** Use mixture calculations (% allowed = $\sum C_n \text{ PEL}_n$) if more than one contaminant is present

Oxygen Deficiency

<u>Concentration</u>	<u>Action Taken</u>
< 19.5% O ₂	Leave area. Reenter only with supplied-air respirators.
19.5% to 23.5% O ₂	Work may continue. Investigate changes from 21%.
> 23.5% O ₂	Work must stop. Ventilate area before returning.

Flammability

<u>Concentration</u>	<u>Action Taken</u>
< 10% of LEL	Work may continue. Consider toxicity potential.
> 10% LEL	Work must stop. Ventilate area before returning.

Radiation

<u>Intensity</u>	<u>Action Taken</u>
< 0.5 mR/hr	Work may continue.
< 1 mR/hr	Work may continue. Continue to Monitor. Notify Corporate Health and Safety and Corporate Health Physicist.
5 mR/hr	Radiation work zone. Work must stop.

APPENDIX E

**MINIMUM AND MAXIMUM DECONTAMINATION STATIONS AND
EQUIPMENT FOR PPE ENSEMBLE LEVELS B AND C**

E-1 MAXIMUM DECONTAMINATION PROCEDURES FOR LEVEL B**Equipment Worn**

This decontamination procedure outlined is the **maximum** number of decontamination stations necessary for Malcolm Pirnie workers wearing the following protective clothing and equipment:

- one-piece, hooded chemical-resistant splash suit
- SCBA
- hard hat
- chemical-resistant boots with steel toe and shank
- boot covers
- inner and outer gloves
- taped joints between gloves, boots, and suit

DECONTAMINATION PROCEDURES***Station 1: Segregated Equipment Dump***

Deposit equipment used on the site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths or in different containers with plastic liners. Each piece of equipment may be contaminated to a different degree; therefore, segregation at the drop reduces the potential for contamination. Equipment needed:

- containers of various sizes
- plastic liners
- plastic drop cloths

Station 2: Suit, Boot Covers, and Glove Wash

Thoroughly wash and scrub fully encapsulating suit, outer boot covers, and gloves with a decontamination solution or detergent-waste solution. Equipment needed:

- container (20 to 30 gallon)
- decontamination solution
- detergent-water solution
- two or three long-handled, soft-bristled scrub brushes

Station 3: Suit, Boot Covers, and Glove Rinse

Rinse off the decontamination solution from Station 2 using copious amounts of water. Repeat as many times as necessary. Equipment needed:

- | | |
|---|--|
| • container (30 to 50 gallon) | • water |
| • high-pressure spray unit and splash guard | • two or three long-handled, soft-bristled scrub brushes |

Station 4: Tape Removal

Remove tape around boots and gloves and deposit it in a container with a plastic liner.

Equipment needed:

- container (20 to 30 gallon)
- plastic liners

Station 5: Boot Cover Removal

Remove boot covers and deposit them in a container with a plastic liner. Equipment needed:

- container (30 to 40 gallon)
- plastic liners
- bench or stool

Station 6: Outer Glove

Remove outer gloves and deposit them in a container with a plastic liner. Equipment needed:

- container (20 to 30 gallon)
- plastic liners

Station 7: Suit, SCBA, Boot, and Glove Wash

If design does not include *Station 2*, wash suit at this station. Thoroughly wash suit, SCBA, boots, and gloves with a long-handled, soft-bristled scrub brush and copious amounts of decontamination solution or detergent-water solution. Wrap SCBA regulator (if belt-mounted type) with plastic to keep out water. Wash backpack assembly with sponges or cloth. Equipment needed:

- | | |
|-------------------------------|--|
| • container (30 to 50 gallon) | • two or three long-handled bristled scrub brushes |
| • decontamination solution | • small buckets |
| • detergent-water solution | • sponges or cloths |

Station 8: Suit, SCBA, Boot, and Glove Rinse

If design does not include *Station 3*, rinse suit at this station. Rinse off the decontamination solution or detergent-water solution using copious amounts of water. Repeat as many times as necessary. Equipment needed:

- container (30 to 50 gallon)
- high-pressure spray unit and splash guard
- water
- small buckets
- two or three long-handled, soft-bristled scrub brushes
- sponges or cloths

Station 9: Tank Change

If a worker leaves the exclusion zone to change their air tank, this is the last step in the decontamination procedure. They exchange the tank, don new outer gloves and boots, and have the joints taped. They then return to duty. Equipment needed:

- air tanks
- tape
- boot covers
- gloves

Station 10: Chemical-resistant Boot Removal

Remove chemical-resistant boots and deposit them in a container with a plastic liner. Equipment needed:

- container (30 to 50 gallon)
- plastic liners
- bench or stool
- bootjack

Station 11: SCBA Backpack Removal

While still wearing face piece, remove backpack and place it on a table. Disconnect hose from regulator valve and proceed to next station. Equipment needed:

- table

Station 12: Splash Suit Removal

With assistance, remove splash suit. Deposit it in a container with a plastic liner. Equipment needed:

- container (30 to 50 gallon)
- plastic liners
- bench or stool

Station 13: Inner Glove Wash

Wash with decontamination solution or detergent-water solution that will not harm skin. Repeat as many times as necessary. Equipment needed:

- basin or bucket
- decontamination solution
- detergent-water solution
- small table

Station 14: Inner Glove Rinse

Rinse with water. Repeat as many times as necessary. Equipment needed:

- water
- basin or bucket
- small table

Station 15: Face Piece Removal

Remove face piece. Deposit it in a container with a plastic liner. Avoid touching face with fingers.

Equipment needed:

- container (30 to 50 gallon)
- plastic liners

Station 16: Inner Glove Removal

Remove inner gloves and deposit them in a container with a plastic liner. Equipment needed:

- container (20 to 30 gallon)
- plastic liners

Station 17: Inner Clothing Removal

Remove inner clothing. Place it in a container with a plastic liner. Do not wear inner clothing off the site, since small amounts of contaminants may have been transferred in removing fully encapsulating suit. Equipment needed:

- container (30 to 50 gallon)
- plastic liners

Station 18: Field Wash

Shower if highly toxic, skin-corrosive, or skin-absorbable materials are known or suspected to be present. Wash hands and face if shower is not available. Equipment needed:

- | | |
|---------------|-------------------|
| • water | • basin or bucket |
| • soap | • field showers |
| • small table | • towels |

Station 19: Redress

Put on clean clothes. A dressing trailer is needed in inclement weather. Equipment needed:

- table
- chairs
- lockers
- clothes

E-2 MINIMUM DECONTAMINATION PROCEDURES FOR LEVEL B**Equipment Worn**

This decontamination procedure outlined is the **minimum** number of decontamination stations necessary for Malcolm Pirnie workers wearing the following protective clothing and equipment:

- one-piece, hooded chemical-resistant splash suit
- SCBA
- hard hat
- chemical-resistant boots with steel toe and shank
- boot covers
- inner and outer gloves
- taped joints between gloves, boots, and suit

DECONTAMINATION PROCEDURES***Station 1: Segregated Equipment Dump***

Deposit equipment used on the site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths or in different containers with plastic liners. Segregation at the drop reduces the probability for cross-contamination. During hot weather operations, cool-down station may be set up within this area. Equipment needed:

- containers of various sizes
- plastic liners
- plastic drop cloths

Station 2: Suit, Boot Covers, and Glove Wash and Rinse

Thoroughly wash and scrub chemical-resistant splash suit, outer boots, and gloves with a decontamination solution or detergent-waste solution. Rinse off using copious amounts of water. Equipment needed:

- | | |
|--------------------------------|--|
| • containers (20 to 30 gallon) | • rinse water |
| • decontamination solution | • high-pressure spray unit and splash guard |
| • detergent-water solution | • two or three long-handled, soft-bristled scrub brushes |

Station 3: Outer Boot and Glove Removal

Remove outer boots and gloves and deposit them in a container with a plastic liner. Equipment needed:

- | | |
|-------------------------------|--|
| • container (30 to 40 gallon) | • water |
| • plastic liners | • two or three long-handled, soft-bristled scrub brushes |
| • bench or stool | |

Station 4: Tank Change

If a worker leaves the exclusion zone to change their air tank, this is the last step in the decontamination procedure. They exchange the tank, don new outer gloves and boots, and have the joints taped. They then return to duty. Equipment needed:

- air tanks
- boot covers
- tape
- gloves

Station 5: Outer Garment Removal

Chemical-resistant splash suit, if worn outside the SCBA, is removed and deposited in separate containers with plastic liners. If the suit is worn underneath the SCBA, see station 5A.

Equipment needed:

- containers (20 to 30 gallon)
- plastic liners

Station 5A: Suit Removal When Worn Underneath the SCBA

If the chemical-resistant splash suit is worn beneath the SCBA, remove SCBA backpack, but not the face piece, and hand to a buddy or lay down on plastic sheeting and remove suit. Equipment needed:

- plastic sheeting

Station 6: SCBA Removal and Decontamination

Wrap SCBA regulator (if belt-mounted type) with plastic to keep out water. Wash backpack assembly with sponges or cloth. Remove face piece while avoiding facial contact by fingers. SCBA is deposited on a clean plastic sheet. Equipment needed:

- water
- small buckets
- sponges or cloths
- plastic sheeting
- two or three long-handled, soft-bristled scrub brushes

Station 7: Inner Glove Removal

Remove inner gloves and deposit them in a container with a plastic liner. Equipment needed:

- container (20 to 30 gallon)
- plastic liners

Station 8: Field Wash

Shower if highly toxic, skin-corrosive, or skin-absorbable materials are known or suspected to be present. Wash hands and face if shower is not available. Equipment needed:

- water
- soap
- small table
- basin or bucket
- field showers
- towels

E-3 MAXIMUM DECONTAMINATION PROCEDURES FOR LEVEL C**Equipment Worn**

This decontamination procedure outlined is the **maximum** number of decontamination stations necessary for Malcolm Pirnie workers wearing the following protective clothing and equipment:

- one-piece coverall
- full-face respirator
- hard hat
- safety boots with steel toe and shank
- boot covers
- inner and outer gloves
- taped joints between gloves, boots, and suit

DECONTAMINATION PROCEDURES***Station 1: Segregated Equipment Dump***

Deposit equipment used on the site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths or in different containers with plastic liners. Each piece of equipment may be contaminated to a different degree; therefore, segregation at the drop reduces the potential for contamination. Equipment needed:

- containers of various sizes
- plastic liners
- plastic drop cloths

Station 2: Boot Covers, and Glove Wash

Thoroughly wash and scrub outer boot covers, and gloves with a decontamination solution or detergent-waste solution. Equipment needed:

- container (20 to 30 gallon)
- decontamination solution
- detergent-water solution
- two or three long-handled, soft-bristled scrub brushes

Station 3: Boot Covers, and Glove Rinse

Rinse off the decontamination solution from Station 2 using copious amounts of water. Repeat as many times as necessary. Equipment needed:

- | | |
|---|--|
| • container (30 to 50 gallon) | • water |
| • high-pressure spray unit and splash guard | • two or three long-handled, soft-bristled scrub brushes |

Station 4: Tape Removal

Remove tape around boots and gloves and deposit it in a container with a plastic liner.

Equipment needed:

- container (20 to 30 gallon)
- plastic liners

Station 5: Boot Cover Removal

Remove boot covers and deposit them in a container with a plastic liner. Equipment needed:

- container (30 to 40 gallon)
- plastic liners
- bench or stool

Station 6: Outer Glove Removal Remove outer gloves and deposit them in a container with a plastic liner. Equipment needed:

- container (20 to 30 gallon)
- plastic liners

Station 7: Canister or Mask Change

If a worker leaves the exclusion zone to change their canister (or mask), this is the last step in the decontamination procedure. The worker's canister is exchanged, new outer gloves and boot covers are donned, joints are taped, and the worker returns to duty. Equipment needed:

- respirator canisters appropriate to the field hazard
- extra respirators
- tape
- boot covers
- gloves

Station 8: Outer Garment Removal

One-piece coverall is removed and deposited in containers with plastic liners. Equipment needed:

- containers (20 to 30 gallon)
- plastic liners

Station 9: Inner Glove Wash

Wash with decontamination solution or detergent-water solution that will not harm skin. Repeat as many times as necessary. Equipment needed:

- | | |
|----------------------------|----------------------------|
| • basin or bucket | • detergent-water solution |
| • decontamination solution | • small table |

Station 10: Inner Glove Rinse

Rinse with water. Repeat as many times as necessary. Equipment needed:

- water
- basin or bucket
- small table

Station 11: Face Piece Removal and Decontamination

Remove face piece while avoiding facial contact by fingers. Face-piece is deposited on a clean plastic sheet. Canisters are removed and deposited in containers with plastic liners. Respirators are scrubbed with soap and water and rinsed with copious amounts of clean water. Equipment needed:

- water
- soap
- small buckets
- small brushes
- sponges or cloths
- plastic sheeting

Station 12: Inner Glove Removal

Remove inner gloves and deposit them in a container with a plastic liner. Equipment needed:

- container (20 to 30 gallon)
- plastic liners

Station 13: Inner Clothing Removal

Remove inner clothing. Place it in a container with a plastic liner. Do not wear inner clothing off the site, since small amounts of contaminants may have been transferred in removing outer suit. Equipment needed:

- container (30 to 50 gallon)
- plastic liners

Station 14: Field Wash

Shower if highly toxic, skin-corrosive, or skin-absorbable materials are known or suspected to be present. Wash hands and face if shower is not available. Equipment needed:

- water
- soap
- small table
- basin or bucket
- field showers
- towel

Station 15: Redress

Put on clean clothes. A dressing trailer is needed in inclement weather. Equipment needed:

- table
- chairs
- lockers
- clothes

E-4 MINIMUM DECONTAMINATION PROCEDURES FOR LEVEL C**Equipment Worn**

This decontamination procedure outlined is the **minimum** number of decontamination stations necessary for Malcolm Pirnie workers wearing the following protective clothing and equipment:

- one-piece coverall
- full-face respirator
- hard hat
- safety boots with steel toe and shank
- boot covers
- inner and outer gloves
- taped joints between gloves, boots, and suit

Station 1: Segregated Equipment Dump

Deposit equipment used on the site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths or in different containers with plastic liners. Segregation at the drop reduces the probability for cross-contamination. During hot weather operations, cool-down station may be set up within this area. Equipment needed:

- containers of various sizes
- plastic liners
- plastic drop cloths

Station 2: Boot Covers, and Glove Wash and Rinse

Thoroughly wash and scrub outer boots, and gloves with a decontamination solution or detergent-waste solution. Rinse off using copious amounts of water. Equipment needed:

- containers (20 to 30 gallon)
- decontamination solution
- detergent-water solution
- rinse water
- high-pressure spray unit and splash guard
- two or three long-handled, soft-bristled scrub brushes

Station 3: Outer Boot and Glove Removal

Remove outer boots and gloves and deposit them in a container with a plastic liner. Equipment needed:

- container (30 to 40 gallon)
- plastic liners
- bench or stool
- water
- two or three long-handled, soft-bristled scrub brushes

Station 4: Canister or Mask Change

If a worker leaves the exclusion zone to change their canister (or mask), this is the last step in the decontamination procedure. The worker's canister is exchanged, new outer gloves and boot covers are donned, joints are taped, and the worker returns to duty. Equipment needed:

- respirator canisters appropriate to the field hazard
- extra respirators
- tape
- boot covers
- gloves

Station 5: Outer Garment Removal

One-piece coverall is removed and deposited in containers with plastic liners. Equipment needed:

- containers (20 to 30 gallon)
- plastic liners

Station 6: Face Piece Removal and Decontamination

Remove face piece while avoiding facial contact by fingers. Face-piece is deposited on a clean plastic sheet. Canisters are removed and deposited in containers with plastic liners. Respirators are scrubbed with soap and water and rinsed with copious amounts of clean water. Equipment needed:

- | | |
|-----------------|---------------------|
| • water | • small brushes |
| • soap | • sponges or cloths |
| • small buckets | • plastic sheeting |

Station 7: Inner Glove Removal

Remove inner gloves and deposit them in a container with a plastic liner. Equipment needed:

- container (20 to 30 gallon)
- plastic liners

Station 8: Field Wash

Shower if highly toxic, skin-corrosive, or skin-absorbable materials are known or suspected to be present. Wash hands and face if shower is not available. Equipment needed:

- | | |
|---------------|-------------------|
| • water | • basin or bucket |
| • soap | • field showers |
| • small table | • towels |

Attachment 7

Hazard Analysis



ACTIVITY HAZARDS ANALYSIS

DATE: July 27, 2009 PROJECT: Pirnie 4553068
USACE W912DQ-08-D-0017, Task Order 0010

ACTIVITY: Lower Passaic River Restoration Project – Cooperating Parties Group (CPG) Oversight

ACTIVITY
LOCATION: New Jersey

PREPARED AmyMarie Accardi-Dey (Oversight Field Leader)
BY: Len Warner (Project Manager)

Overall Risk Assessment Code (RAC)

L

Risk Assessment Code Matrix

E= Extremely High
H= High Risk
M= Moderate Risk
L= Low Risk

		Probability				
		Frequent	Likely	Occasional	Seldom	Unlikely
Severity	Catastrophic	E	E	H	H	M
	Critical	E	H	H	M	L
	Marginal	H	M	M	L	L
	Negligible	M	L	L	L	L



ACTIVITY HAZARDS ANALYSIS

Job Steps	Hazard	Actions to Eliminate or Minimize Hazards	RAC (E,H,M,L)
Boat Activity: Oversight of benthic community survey and fish community survey (Tasks 1 and 2 in HASP)	Boat safety Immersion/drowning Heat/Cold Exposure Potential Splash Hazard Slip/trip/fall	Oversight (work being conducted by CPG) PPE plus required PFD. Extra clothing to protect from elements when on vessel. Mustang suit when water temperature is <50F. If client requests that Malcolm Pirnie provide transportation of oversight personnel, vessel operator will be certified by USCG or USPS and vessel will be inspected by USCG.	L
Field Activity: Oversight of fish tissue sampling (Task 3 in HASP)	Slip/trip/fall Potential splash hazard Potential chemical exposure	Oversight (work being conducted by CPG) PPE and oversight staff will remain outside the exclusion zone.	L
Field and Office Activity: Split sample collection of toxicity tests (Task 4 in HASP)	Slip/trip/fall Potential splash hazard Potential chemical exposure Handling heavy supplies	Oversight (work being conducted by CPG) PPE and oversight staff will remain outside the exclusion zone. Split samples will be collected by the CPG field crew, and custody of samples will be transferred to oversight crew.	L
Office Activity: Split sample collection of bioaccumulation tests (Task 5 in HASP)	Slip/trip/fall Handling heavy supplies	Oversight (work being conducted by CPG) PPE for sample management (as necessary) Split samples will be collected and shipped by the CPG assigned laboratory.	L
Field and Office Activity: Split sample collection of sediment samples	Slip/trip/fall Potential splash hazard Potential chemical exposure Handling heavy supplies	Oversight (work being conducted by CPG) PPE and oversight staff will remain outside the exclusion zone. Split samples will be collected by the CPG field crew, and custody of samples will be transferred to oversight crew.	L



ACTIVITY HAZARDS ANALYSIS

Equipment	Training	Inspection Requirements
Sample management supplies (including coolers and jars)	40-hour HAZWOPER	USACE required HASP audit
Oversight forms	8-hour refresher within last year	USACE required QA/QC audit
	USCG or USPS certification for vessel operator	

X 

Acceptance

- Involved Personnel:**
Len Warner (Project Manager)
AmyMarie Accardi-Dey (Oversight Field Leader)
Jim McCann (Site Quality Control Officer)
Xiulan Wang (Sample Management)
Brian Gillen (Biologist)
Dennis Corelli (Biologist)
Julie Conklin (Biologist)
Doug Auld (Vessel Operator)
Dave Foster (Vessel Operator)